PrintServer 32 Printer

Service Guide

This is a draft 2 version of the PrintServer 32 service guide. It might contain many errors, omissions, and is incomplete.

EK–FIELD–DK

Digital Equipment Corporation
Maynard, Massachusetts

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The Reader's Comments form at the end of this document requests your critical evaluation to assist in preparing future documentation.

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Preface

This guide covers the repair and maintenance of the PrintServer 32 printer.

This guide does not cover the maintenance procedures that customers perform, such as replacing the main charger or cleaning the quenching lamp. Customer maintenance information can be found in the respective maintenance kit guides.

Intended Audience

This guide helps Customer Services engineers repair and maintain the PrintServer 32. The repair information is restricted to the printer hardware only. The troubleshooting procedures note the corrective action to take for a software or network problem; the organization to contact is also noted.

Conventions

The following terms and conventions are used in this manual:

Term/Convention	Meaning
NOTE	Provides additional information.
CAUTION	Provides information for preventing equipment or software damage.
WARNING	Provides information for preventing personal injury.
OPC	The organic photo conductor is the type of drum the printer uses. OPC drums can be disposed of without taking any special precautions.

Term/Convention	Meaning
Bullet (•)	A bulleted statement describes a result after performing a step. For example: 1. Press the Pause key to place the printer off line. • The off-line indicator lights.
Arrow (→)	Indicates a special instruction. For example: 1. Remove the toner cartridge from the drawer by lifting it straight up. → Discard the toner cartridge.

About This Service Guide

This service guide consists of the following elements:

- Chapter 1 contains physical descriptions and technical information about the PrintServer 32.
- Chapter 2 describes the PrintServer 32 power-up and bootstrap steps.
- Chapter 3 describes the switches and indicators that you use to troubleshoot the PrintServer 32.
- Chapter 4 describes the Field Test Mode (FTM). FTM is a troubleshooting tool that manually operates the PrintServer 32.
- Chapter 5 describes how to invoke, operate, and read the PrintServer 32 query mode.
- Chapter 6 contains the start fault isolation procedure (FIP), the error listing tables, and describes the display messages.
- Chapter 7 contains the power and LCD panel message FIPs.
- Chapter 8 describes the FIPs to correct malfunctions that cause paper jams in the PrintServer 32.
- Chapter 9 provides the FIPs to correct print quality defects in the PrintServer 32.
- Chapter 10 explains how to disassemble, remove, and replace field replaceable units (FRUs).
- Chapter 11 explains the two PrintServer 32 maintenance procedures.
- Chapter 12 describes the PrintServer 32 margin adjustments and engine board menu.
- Appendix A contains the recommended spare listings (RSL) and an alphabetized listing of the field replaceable units (FRUs).
- Appendix B provides information about total call concept (TCC).

- Appendix C provides information about the documentation, tools, and training required to perform service on the PrintServer 32 printer.
- The Glossary of Parts identifies each part and its function.
- The Index is for locating hard to find topics.

1 Technical Information

This chapter contains physical descriptions and technical information about the PrintServer 32.

1.1 Laser and Ozone Safety Considerations

The PrintServer 32 includes components that may harm individuals and equipment if not handled properly.

Laser Safety

The PrintServer 32 complies with laser product performance standards set by government agencies as a Class 1 Laser Product. The PrintServer 32 does not emit hazardous light, since the beam is enclosed during all modes of operation and maintenance.

Ozone Safety

The PrintServer 32 uses an ozone filter to remove the ozone generated by the printer. Each time you service the printer, inspect the condition of the ozone filter. Replace the filter at the intervals recommended in Chapter 11 or if it is damaged.

Warning: *Do not operate the printer without the ozone filter installed. The filter removes ozone that may cause eye or respiratory irritation.*

Use of controls or adjustment procedures other than those specified in this manual may result in hazardous laser light exposure.

1.2 Maintenance Philosophy and Prerequisites

The PrintServer 32 maintenance philosophy is to isolate a problem to a failing field replaceable unit (FRU) and then swap and replace that FRU. This philosophy is made possible by the modular design of the hardware and by the diagnostics resident in the read-only memory (ROM).

1.2 Maintenance Philosophy and Prerequisites

This guide works with the theory of operation and experience learned in the approved Educational Services Customer Services training course, listed in Section C.3. To repair the PrintServer 32, you need to understand the following tools and processes:

- Power-up, self-test, and bootstrap processes, shown in Chapter 2
- Call Field Service messages, which are displayed when a fatal error occurs during normal on-line operation
- Operator panel field mode commands, shown in Chapter 4
- Query mode Nth status bytes, shown in Chapter 5
- Operation and error reporting of the controller board diagnostics, shown in Chapter 6
- Fault isolation procedures (FIPs), a collection of yes/no flow charts and tables, shown in Chapter 7, Chapter 8, and Chapter 9
- The engine drive board operation explained in Chapter 12.

Warning: *This guide is to be used by trained service personnel only. Do not service the PrintServer 32 unless you have completed the following courses outlined in Section C.3.*

1.3 Description of the PrintServer 32

The PrintServer 32 is a high-quality xerographic printer that uses laser electrophotographic printing techniques. It can print at a maximum speed of 32 pages per minute. The printer interprets data encoded in the PostScript page description language, which integrates text and graphics. The PrintServer software allows shared use by Ethernet connected computers.

1.3.1 PrintServer 20 and PrintServer 32 Differences

The PrintServer 32 is nearly identical to the PrintServer 20. The differences are as follows:

- The improved top speed is 60% faster.
- The print engine mechanical drive units are strengthened, upgraded, and in a few cases completely redesigned.
- All new redesigned controller boards
- Customers can chose between simplex and duplex PrintServer 32 models but the duplex unit upgrade kit is not customer installable.

- The following are LCOT design changes
  - A new LCOT motor drives the paper path rollers in the LCOT and engine fork gate units.
  - Two pairs of sensors improves the performance of the upper and lower (LCOT) stack overflow circuit.
- The following features are available through the engine drive board menus that are explained in Chapter 12.
  - Eight electronic image position adjustments are available through the engine drive board menus. The service engineer performs the adjustments after the replacing specific FRUs or if the customer's demands warrant it.
  - The six electronic page and power-on counters are readable through the engine drive board menus. The page count counters operate on main motor rotation time and are categorized as total, power on, and maintenance counters.
- The new LCIT has the following features:
  - The unit is optional and customer installable.
  - The paper front door is side-hinged for ease of loading.
  - Seven different paper-size plates provide better support and fewer paper jams.

1.4 Physical Description

This section describes the location of each major component of the PrintServer 32 printer.

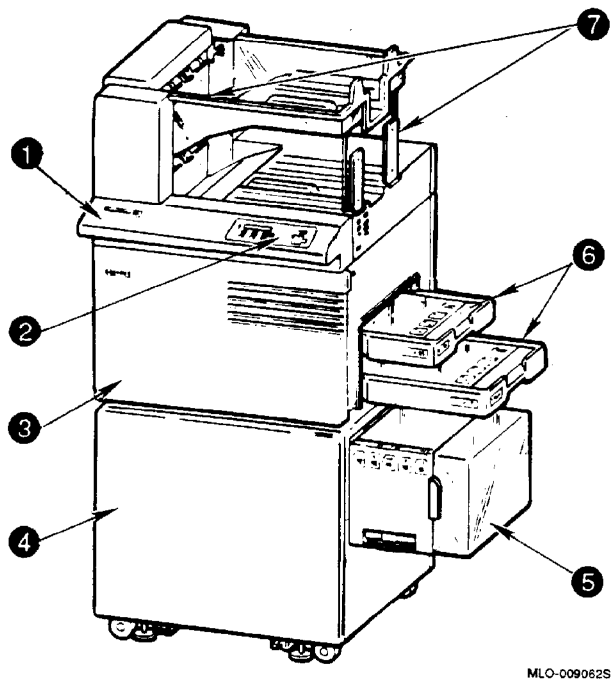
Table 1–1 describes the components shown in Figure 1–1, Outside Front View.

Table 1–1 Outside Front View

❶	The **front cover** holds the operator's panel and swings open for card-cage access.
❷	The **operator's panel** displays operational and service information and status. See Section 3.1 for an illustrated definition of the operators panel.
❸	The **front door** opens for jam clearance, operator and service maintenance.
❹	The **cabinet door** opens for duplex and LCIT jam clearance and servicing.
❺	The **LCIT door** opens for paper loading.
❻	The **upper and lower cassettes** each hold 250 sheets of cut paper. Each cassette is keyed for size identification.
❼ ❽	The **upper stack** and **lower stack** pile paper face-down. Each stack is equipped with an overflow sensor and job offset feature hardware.

1.4 Physical Description

Figure 1–1 Outside Front View



1.4 Physical Description

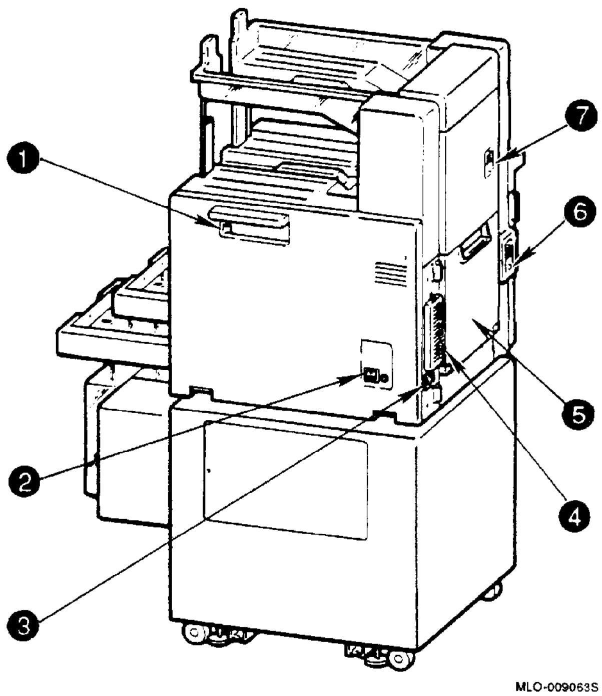
Table 1–2 describes the components shown in Figure 1–2, Outside Rear View.

Table 1–2 Outside Rear View

❶	The **interface panel** consists of the Ethernet connector and the T switch. The Ethernet connector is a standard 801 type. The **T** switch is not visible in Figure 1–2 is not used.
❷	The **AC power line connector** connects the PrintServer 32 to the sites 115 or 220 volt AC power line.
❸	The **(0/1) switch** turns the AC power on and off.
❹	The **ozone filter** cleans the exhaust air from the interior of the printer and is necessary for safe operation of the printer.
❺	The **side tray** swings open to pile paper face-up. This stack is useful when printing on heavy or stiff media that is unable to pass through the curves of the duplex or face up paper paths.
❻	The **engine side door** swings opened for jam clearance.
❼	The **LCOT** door swings open for jam clearance or servicing.

1.4 Physical Description

Figure 1–2 Outside Rear View



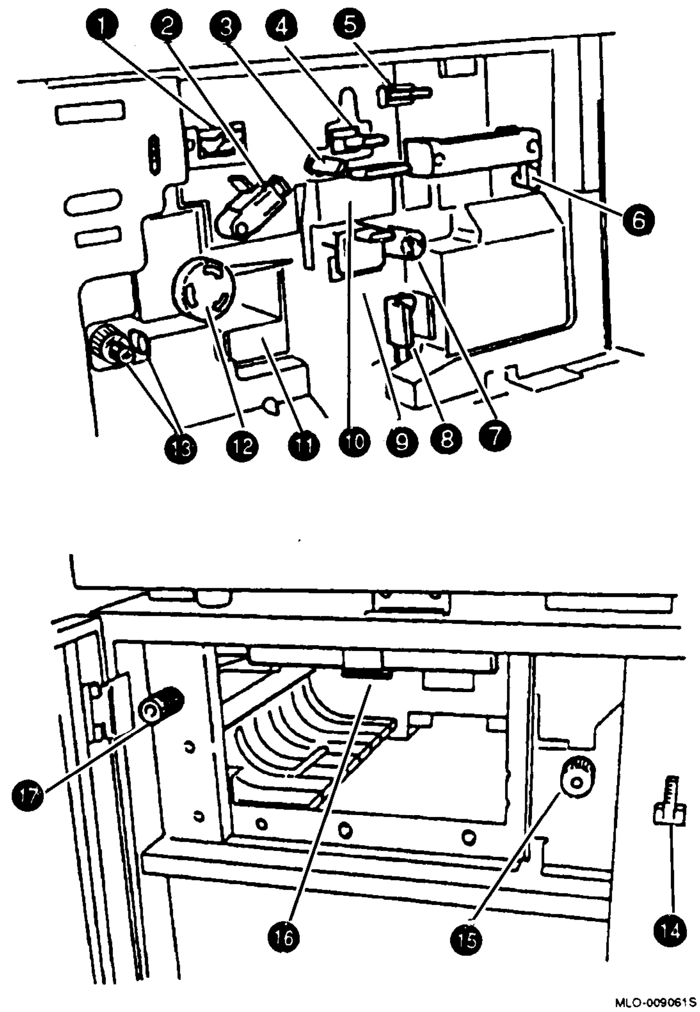
1.4 Physical Description

Table 1–3 describes the components shown in Figure 1–3, Inside the Engine and Cabinet.

Table 1–3 Inside the Engine and Cabinet

❶	The **drawer release** unlatched the development draw.
❷	The **cleaning unit release** withdraws the cleaning unit from the OPC drum. It only releases when the drawer is open and closes automatically when the drawer is closed.
❸	The **quench lamp** handle is used to remove and replace the quench lamp unit from the print engine.
❹	The **main charger** handle is used to remove and replace the main charger unit.
❺	The **shield glass** handle is used to remove and replace the shield glass unit.
❻	The **development unit release** withdraws the developer unit from the OPC drum. It only releases when the drawer is open and closes automatically when the drawers closed.
❼	The **registration knob** turns the registration rollers.
❽	The **jam release lever** opens the lower paper path guides to remove jammed paper.
❾	The **transfer/separation** charger handle is used to remove and replace the transfer/separation charger.
❿	The **transfer charge guide** swings down for jam clearance access.
⓫	The **transport plate** swings down for jam clearing access.
⓬	When pulled out and turned, the **fusing unit** knob easily turns the fusing unit roller and disengages the the fusing roller drive gear from the main drive unit.
⓭	The **fusing unit release lever** and **release lever lock** are used to remove the fusing unit.
⓮	Use the **transfer cleaner** to remove toner from the transfer charge wires.
⓯	Turn the **cabinet feed knob** to move stalled paper up into the registration rollers.
⓰	This **release lever** opens the duplex transport plate.
⓱	Push-in and turn the **transport knob** to remove engage and turn the entrance rollers and move stalled paper into the transport.

Figure 1–3 Inside the Engine and Cabinet



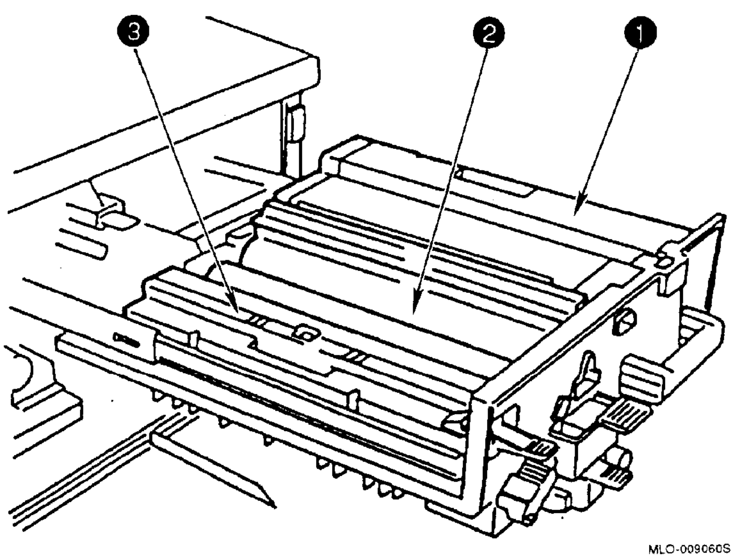
1.4 Physical Description

Table 1–4 describes the components shown in Figure 1–4, Development Draw Components.

Table 1–4 Development Drawer Components

❶	The **development unit** contains the development rollers and toner supply. When the **Add toner** message is displayed, the customer must load new toner. The toner supply lasts approximately 15,000 prints, depending on much toner is placed on the page.
❷	The **organic photoconductor (OPC)** print drum is sensitive to light and fingerprints. It is replaced by the customer every 100,000 prints.
❸	The **cleaning unit** contains exhausted toner. When the **Cleaning Unit Full** message is displayed, the customer must replace the unit. This occurs approximately every 30,000 prints, depending on how much toner is used.

Figure 1–4 Development Draw Components

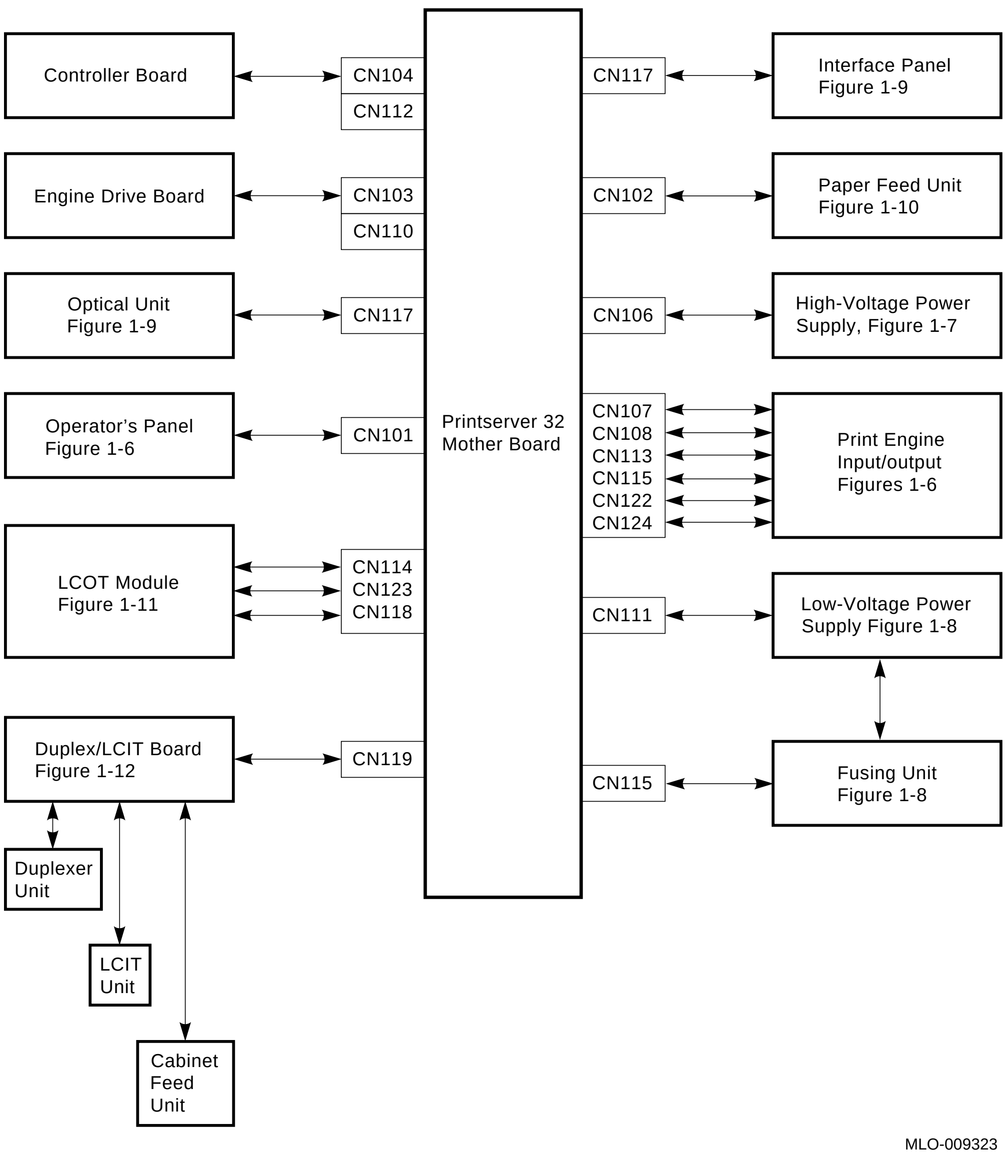


1.5 Wiring Diagrams

Figure 1–5 shows how all electrical devices in the PrintServer 32 are organized around the mother board which is mounted on the rear of the card cage.

1.5 Wiring Diagrams

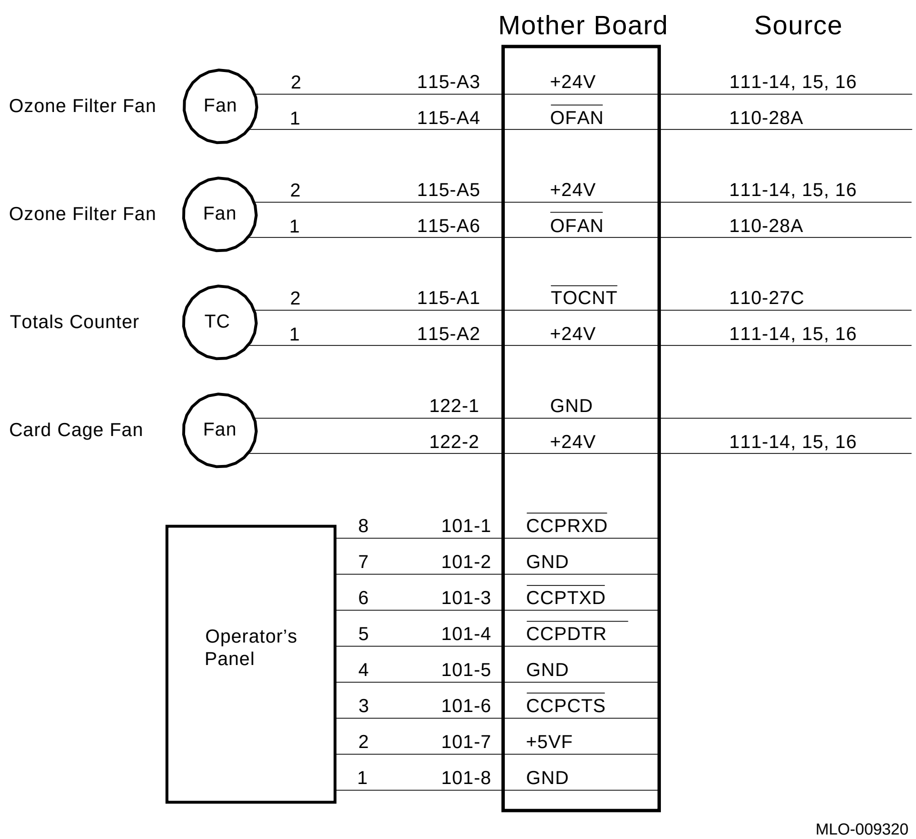
Figure 1–5 Mother Board



1.6 Print Engine Input/output Devices

Figure 1–6 continues on for three pages and shows all the electromechanical devices in the print engine.

Figure 1–6 Engine Diagrams



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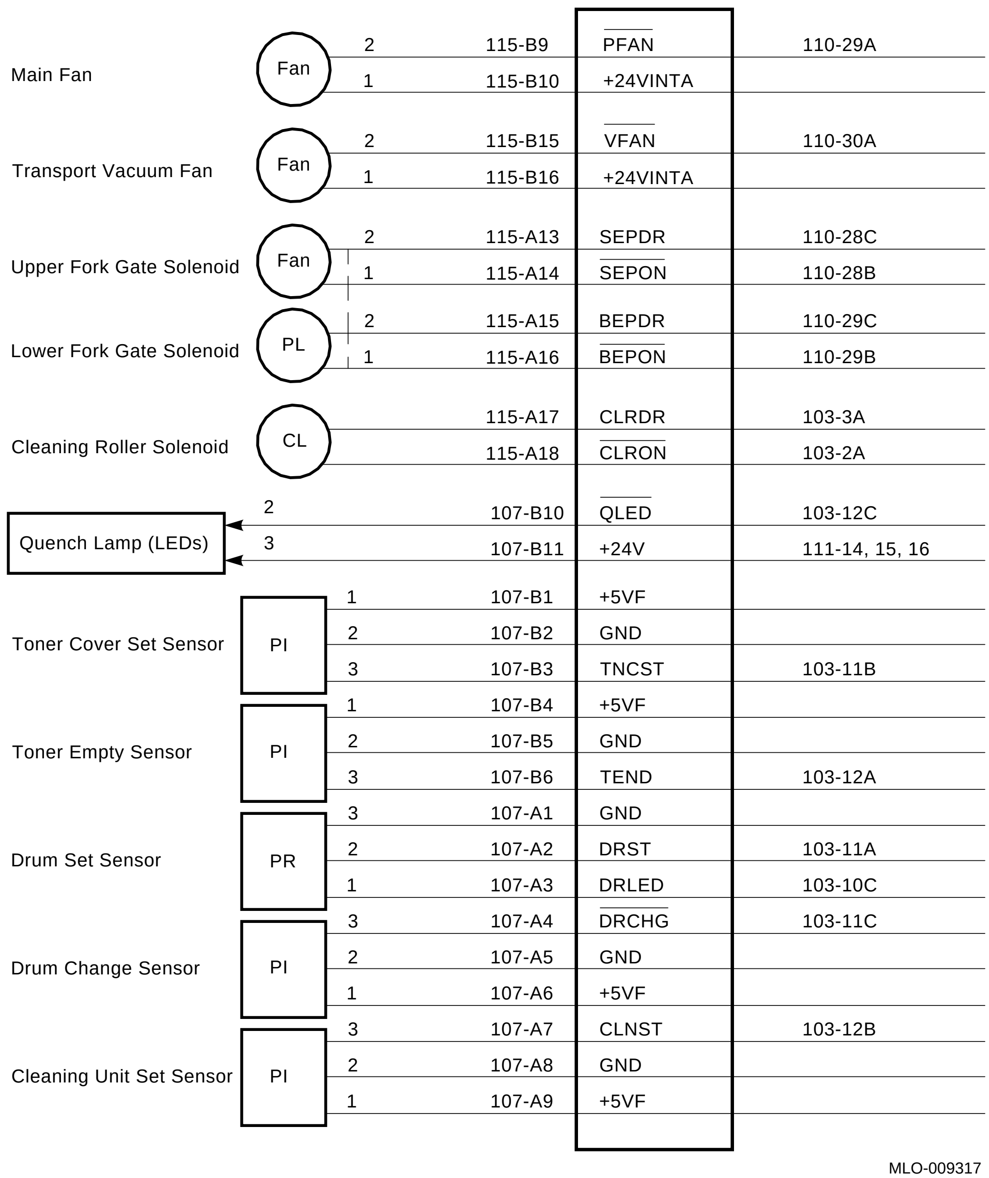
1.6 Print Engine Input/output Devices

Figure 1–6 (Cont.) Engine Diagrams



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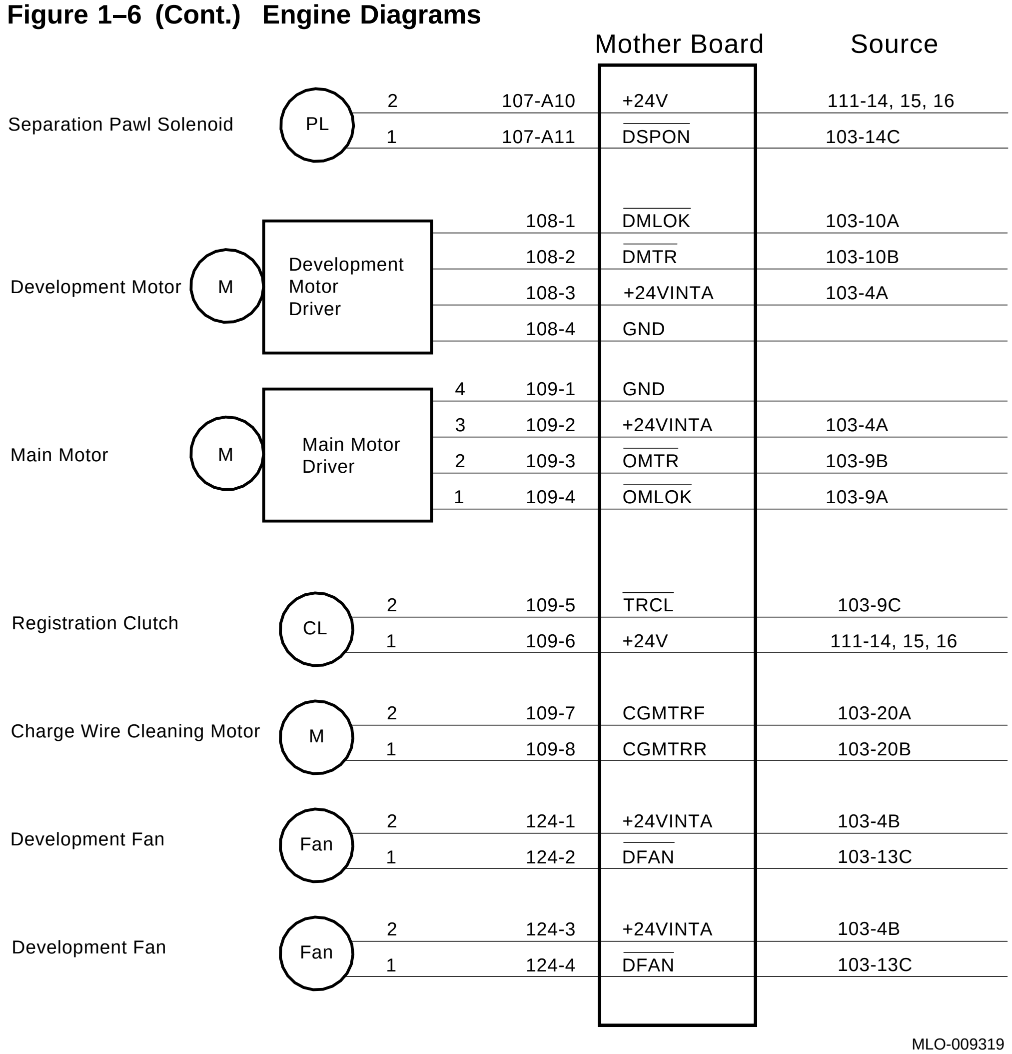
1.6 Print Engine Input/output Devices

Figure 1–6 (Cont.) Engine Diagrams



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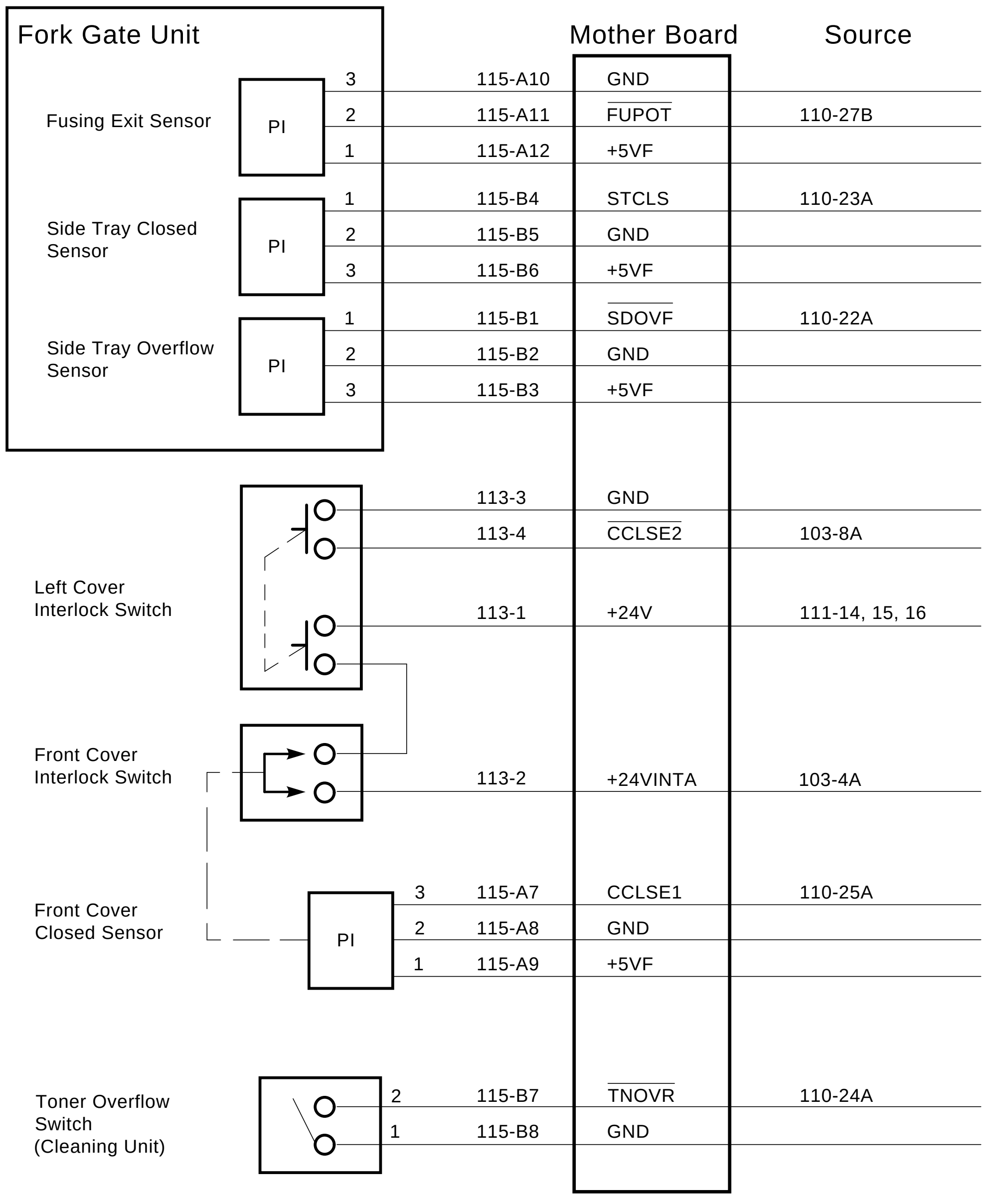
1.6 Print Engine Input/output Devices

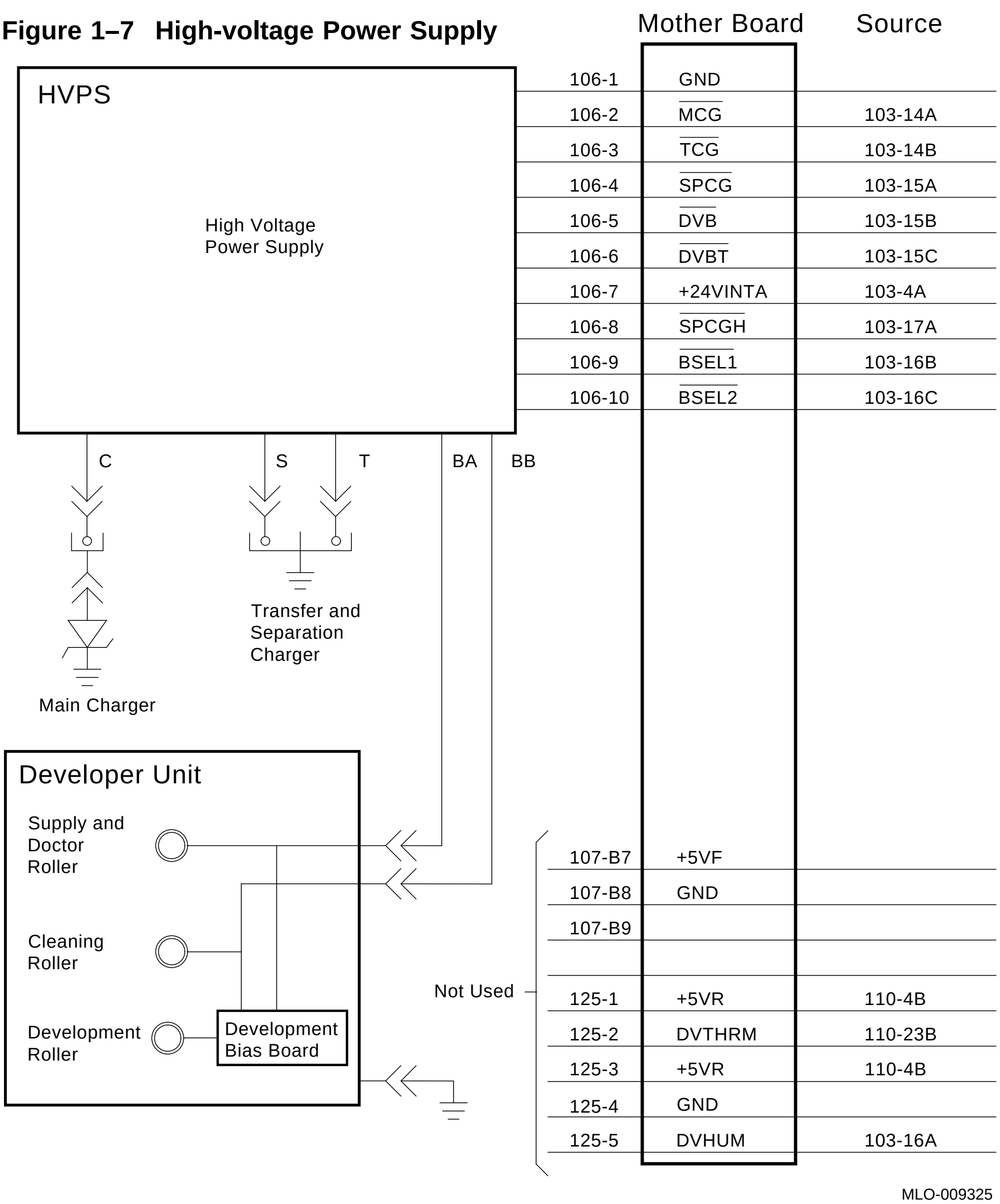
Figure 1–6 (Cont.) Engine Diagrams



1.7 High-voltage Power Supply

Figure 1–7 is a wiring diagram for the high-voltage power supply. See Section 10.15 for location and mounting information.

Figure 1–7 High-voltage Power Supply

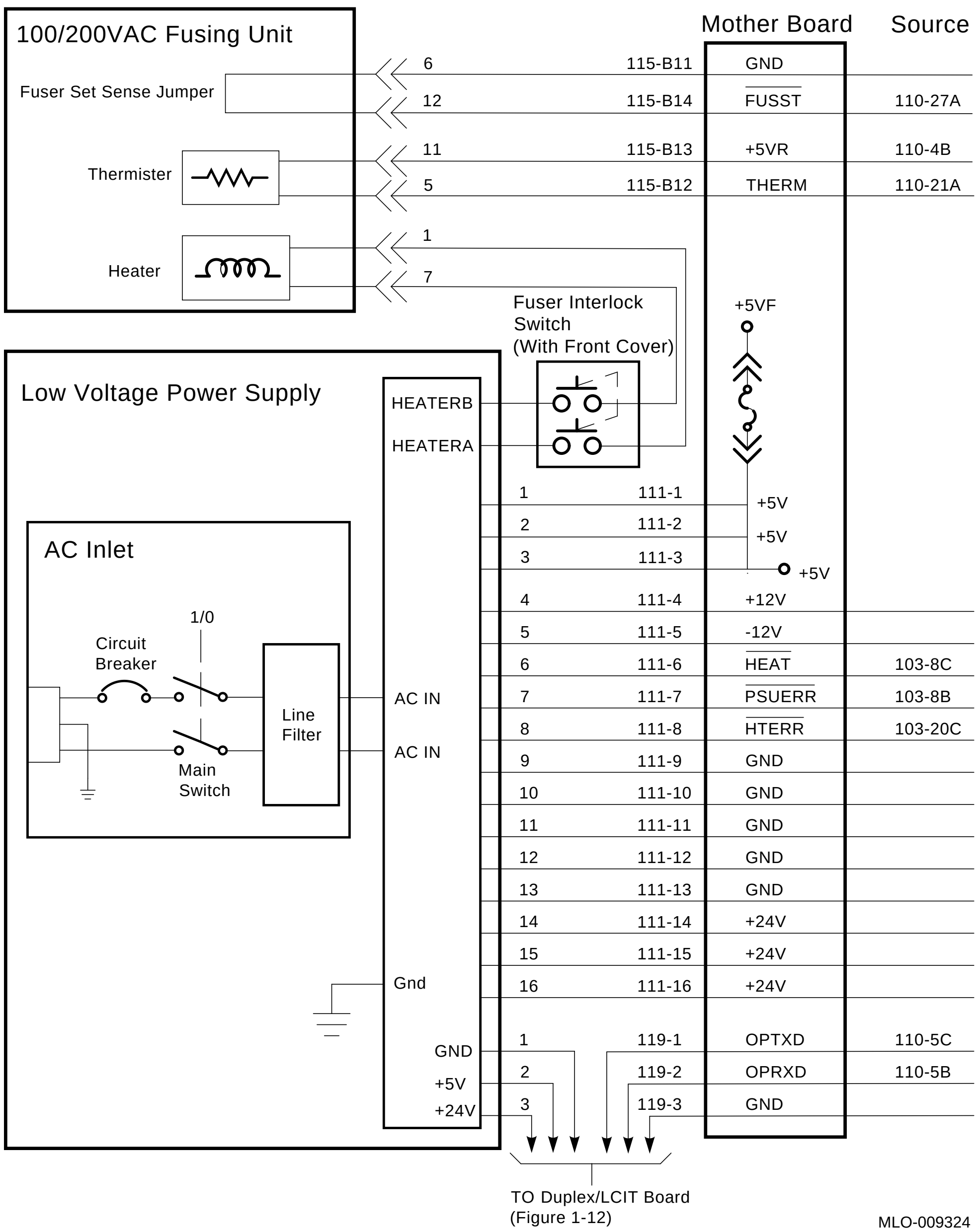


1.8 Low-voltage Power and Fuser

Figure 1–8 is a wiring diagram for the fuser unit, for the interlock switch bracket and for the low-voltage power supply which controls the fuser heater current.

See Sections 10.20, 10.13, and 10.14 for component location and removal replacement procedures.

Figure 1–8 Low-voltage Power and Fuser



1.9 Optical Unit and Interface panel

Figure 1–9 is a wiring diagram for the optical unit and for the interface panel. See Sections Section 10.28 and Section 10.16 for location and removal replacement information.

The T switch has no field application.

Figure 1–9 Optical Unit and Interface Panel

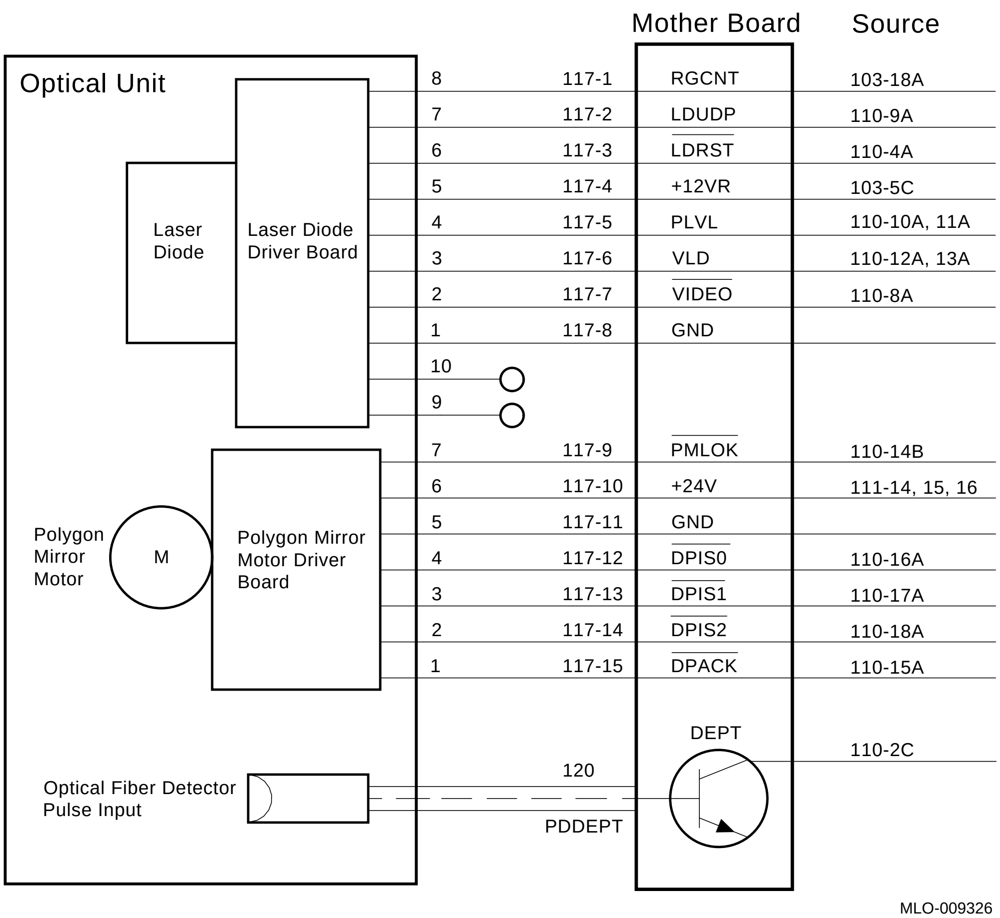


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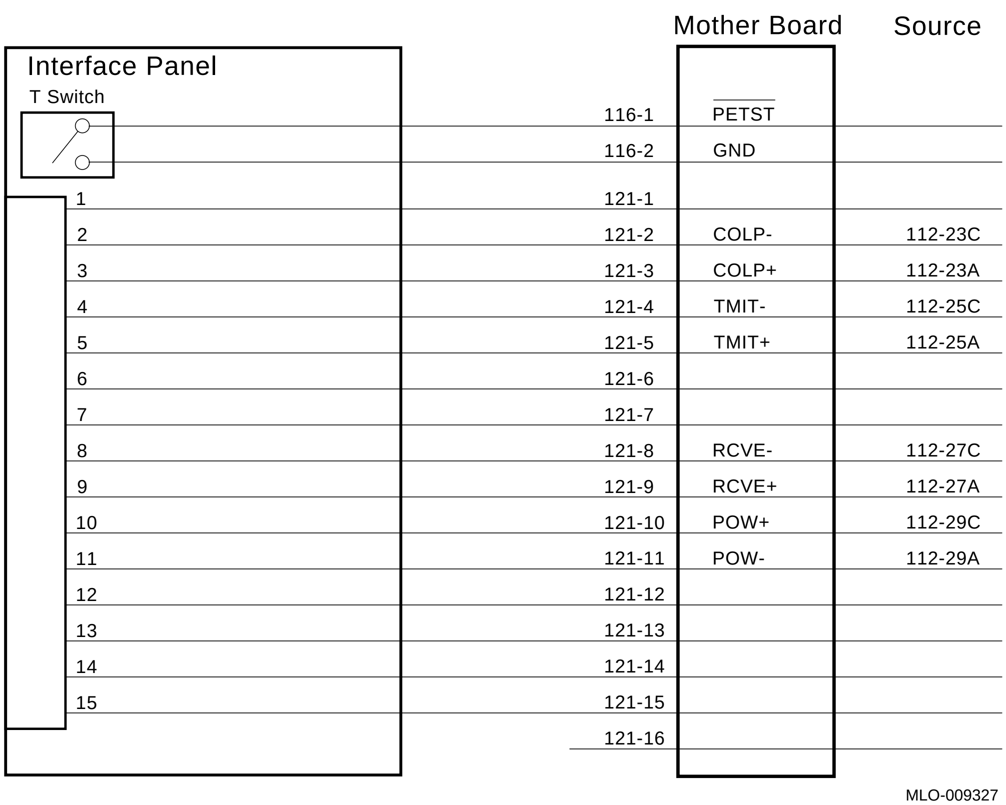
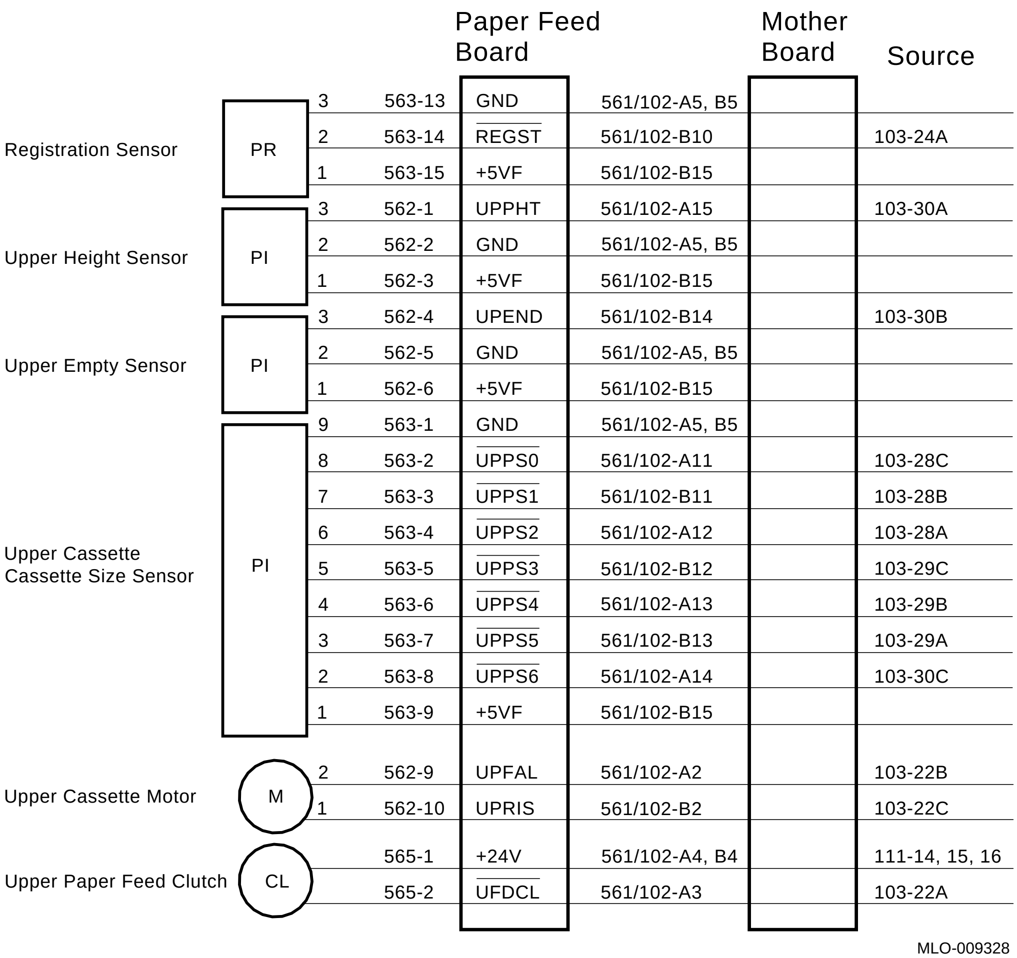
Figure 1–9 (Cont.) Optical Unit and Interface Panel



1.10 Cassette Paper Feed Unit

Figure 1–10 is a diagram for the cassette paper feed unit. This unit operates both upper and lower cassette and contains the registration sensor. See Section 10.3 for location and removal replacement information.

Figure 1–10 Paper Feed Unit



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1.10 Cassette Paper Feed Unit

Figure 1–10 (Cont.) Paper Feed Unit

Component	Pin	Connector	Paper Feed Board		Mother Board	Source
Upper Cassette Motor (M)	2	562-9	UPFAL			103-22B
	1	562-10	UPRIS			103-22C
Upper Paper Feed Clutch (CL)	2	565-1	+24V			111-14, 15, 16
	1	565-2	$\overline{\text{UFDCL}}$			103-22A
Lower Height Sensor (PI)	3	564-1	LWPHT	561/102-A10		103-27A
	2	564-2	GND	561/102-A5, B5		
	1	564-3	+5VF	561/102-B15		
Lower Empty Sensor (PI)	3	563-10	LWEND	561/102-B9		103-27B
	2	563-11	GND	561/102-A5, B5		
	1	563-12	+5VF	561/102-B15		
Lower Cassette Cassette Size Sensor (PI)	9	564-4	GND	561/102-A5, B5		
	8	564-5	$\overline{\text{LWPS0}}$	561/102-A6		103-25C
	7	564-6	$\overline{\text{LWPS1}}$	561/102-B6		103-25B
	6	564-7	$\overline{\text{LWPS2}}$	561/102-A7		103-25A
	5	564-8	$\overline{\text{LWPS3}}$	561/102-B7		103-26C
	4	564-9	$\overline{\text{LWPS4}}$	561/102-A8		103-26B
	3	564-10	$\overline{\text{LWPS5}}$	561/102-B8		103-26A
	2	564-11	$\overline{\text{LWPS6}}$	561/102-A9		103-27C
	1	564-12	+5VF	561/102-B15		
Lower Cassette Motor (M)	2	562-7	LWRIS	561/102-B1		103-21C
	1	562-8	LWFAL	561/102-A1		103-21B
Lower Cassette Paper Feed Clutch (CL)		566-1	+24V	561/102-A4, B4		111-14, 15, 16
		566-2	$\overline{\text{LFDCL}}$	561/102-A3		103-21A

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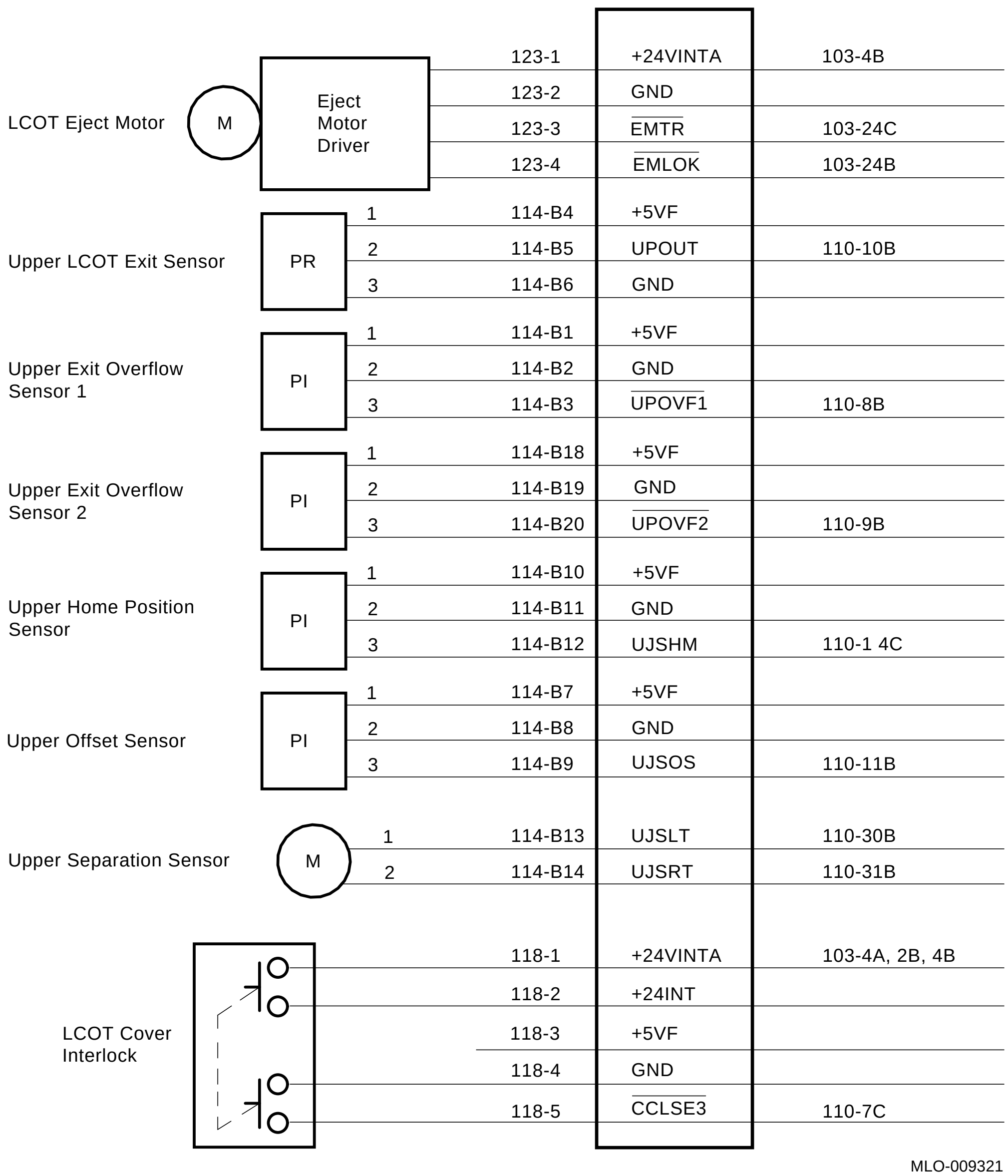
1.11 LCOT Unit

The two diagrams in Figure 1–11 are wiring diagrams for the LCOT. See Section 10.19 for LCOT location and for removal replacement information.

Figure 1–11 LCOT Diagrams



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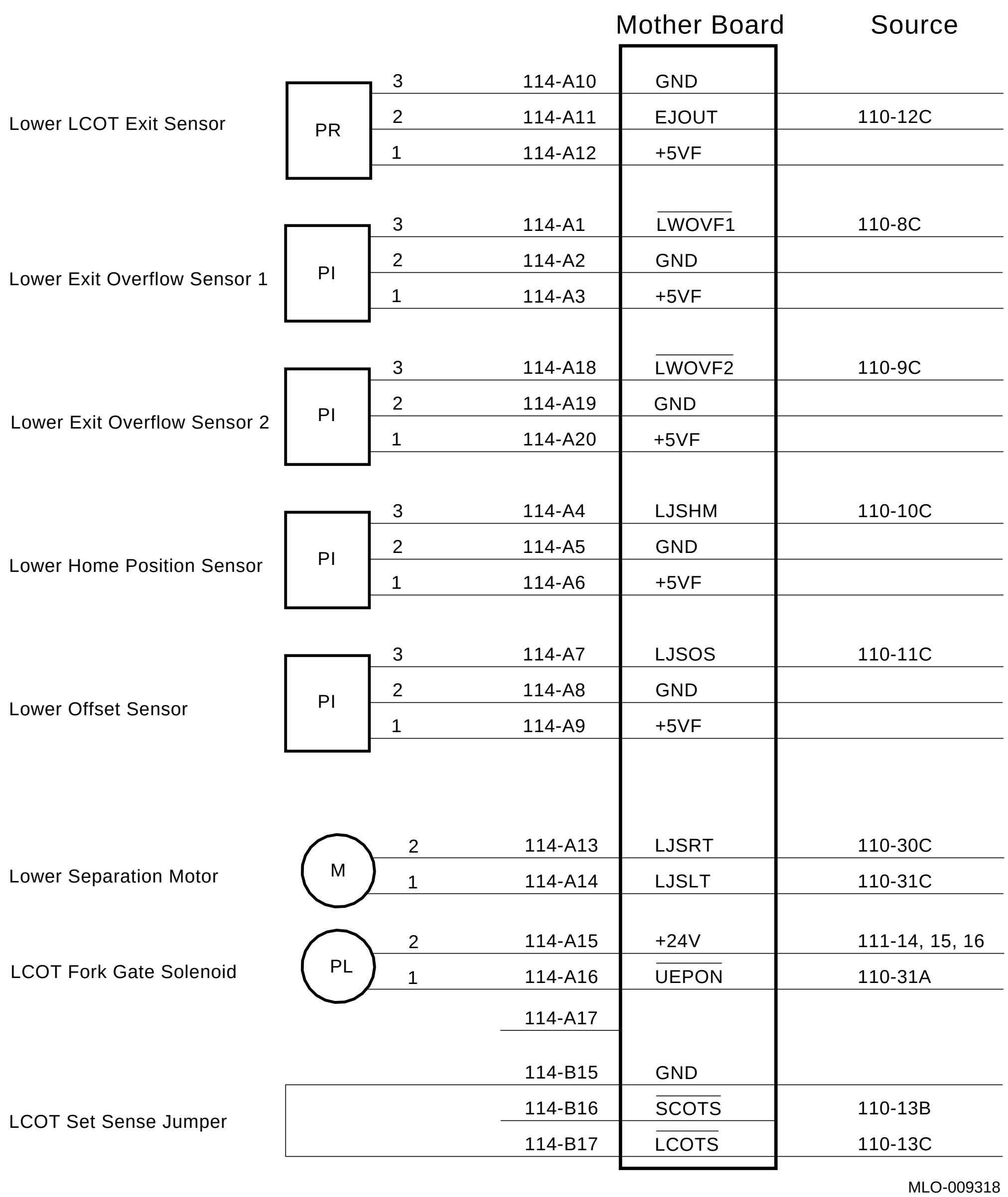
1.11 LCOT Unit

Figure 1–11 (Cont.) LCOT Diagrams

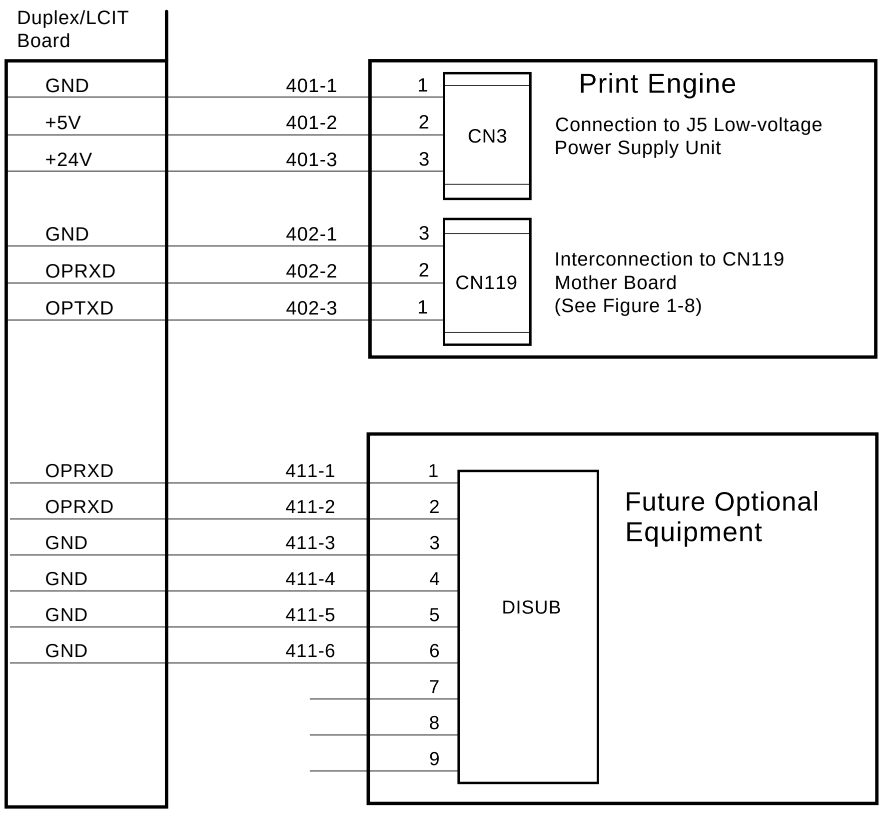


1.12 Duplexer/LCIT Control Board Wiring Diagrams

Figure 1–12 continues on for three pages showing the wiring diagrams for the duplexer, cabinet feed, and LCIT feed unit. These devices connect to the duplexer LCIT control board which is mounted at the rear of the cabinet.

See Sections 10.9, 10.1, and 10.17 for unit locations and for removal replacement information.

Figure 1–12 Duplex/LCIT Control Board



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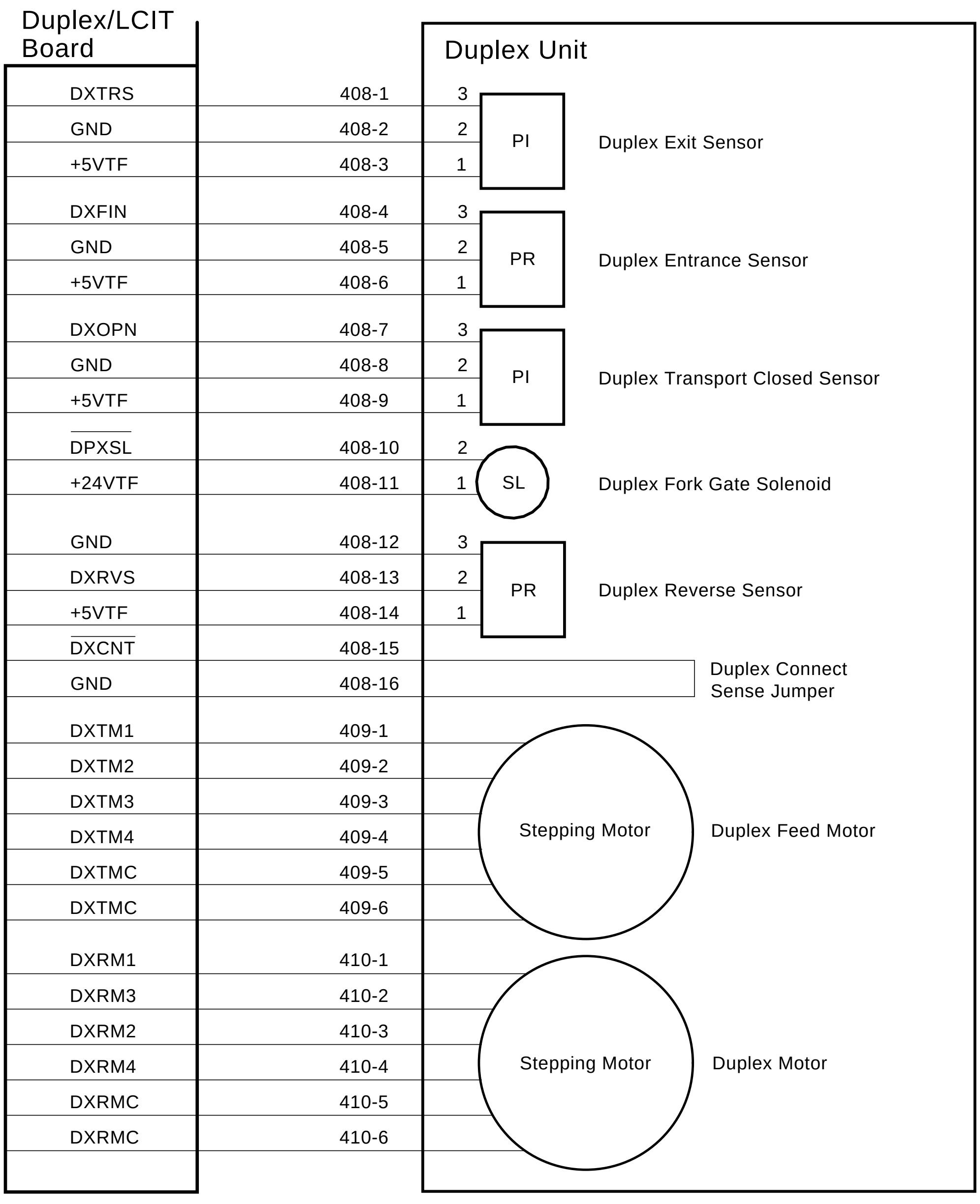
1.12 Duplexer/LCIT Control Board Wiring Diagrams

Figure 1–12 (Cont.) Duplex/LCIT Control Board



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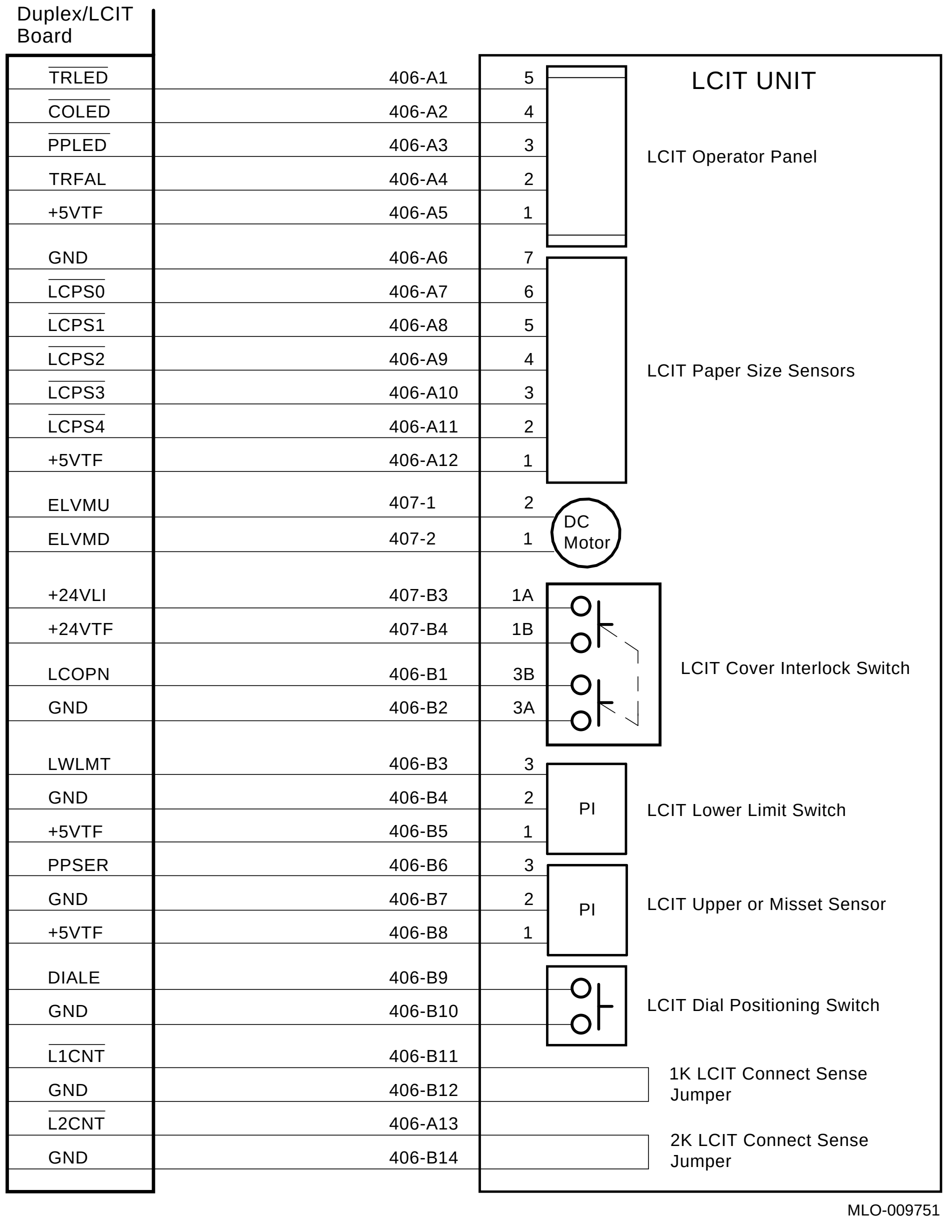
1.12 Duplexer/LCIT Control Board Wiring Diagrams

Figure 1–12 (Cont.) Duplex/LCIT Control Board



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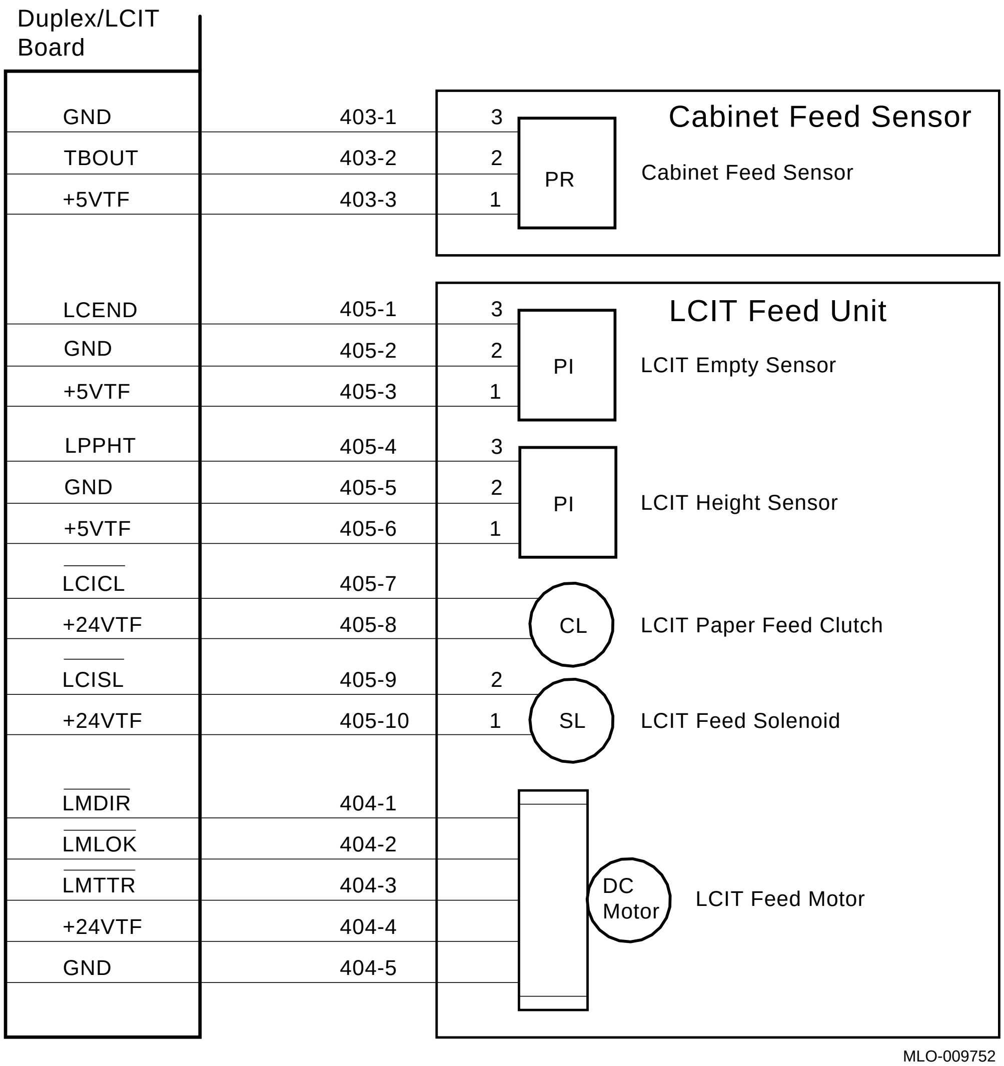
1.12 Duplexer/LCIT Control Board Wiring Diagrams

Figure 1–12 (Cont.) Duplex/LCIT Control Board



2

System Power-Up and Bootstrap

This chapter describes the PrintServer 32 power-up and bootstrap steps.

2.1 Powering-Up the Printer

When the ac power is turned on, the self-test diagnostic runs and completely tests the electronic controller, print engine, and duplexer/LCIT control boards:

If the self-test is successful, the bootstrap program down-line loads the operating system files from the supporting host into the memory of the controller. If the files load successfully, the bootstrap program runs the operation system.

The operating system then brings the printer to the on-line or Ready state.

2.2 Step 1: Running the Self Test

When you power up the PrintServer 32, all the indicators on the operator panel blink and two rows of solid blocks appear on the display. If this display does not occur, see Section 6.3.

After power up the self-test displays the following message on the LCD display of the operator panel:

9,8,7,6,5,4,3,2,1,0

The progress countdown numbers are similar to the MicroVAX console terminal power-up display. Do not confuse the countdown numbers with self-test subtest numbers.

2.2 Step 1: Running the Self Test

Nonfatal errors, jams, interlocks, supplies, and tray errors do not affect the boot progress. However, if the self-test finds a fatal error, the following occurs:

1. The normal boot process stops. The self-test will not proceed beyond the point of the failing fatal error.
2. Field test mode (FTM) is automatically entered. See Chapter 4 for FTM information.
3. A detailed operator panel error message appears on the LCD display. See Chapter 7 for message translation.

   Note: *A primitive self-test message is displayed on the controller board display. See Table 3–3 for message translation.*

2.3 Step 2: Running the Bootstrap Program

After the self-test has successfully passed or has counted down past zero, the boot program starts, the 2.5 minute rounding cycle commences, and the Ethernet address is displayed. During the rounding cycle, all the paper path motors and rollers turn.

The Ethernet address display is 12 hexadecimal digits. The system manager needs the Ethernet address to configure the host software.

XX-XX-XX-XX-XX-XX

The message display then shows the firmware version numbers for the controller board, print engine drive board, and Duplexer/LCIT drive board.

C.C E.E D.D.

The boot program continually broadcasts boot requests until a supporting host replies. The error message **?54, ?55** or **?4** is displayed if a reply is not received after a number of boot attempts. See Chapter 7 for an explanation of this problem.

- No connection to host through Ethernet.
- The host is not on line.
- An incorrect Ethernet address was entered at installation time.
- The software was incorrectly installed or setup.
- An incorrect boot file was received.

Examine and fix the supporting host or call software support to diagnose the installed PrintServer software.

2.4 Step 3: Down-Line Loading Software

The supporting host that is physically closest, enabled, and configured will reply to the boot request by down-line loading the **three or four** boot files to the printer. Down-line loading consists of copying files from the supporting host directory, across the Ethernet medium, and into the controller board memory.

Control is passed to the down-line loaded file, and the following messages are displayed:

XX-XX-XX-XX-XX-XX
VAX ELN V4.2 LPS

VAX ELN V4.2 LPS
. . .

or

LOADING PrintServer
. . . . .

The dots are sequentially displayed after the printer down-line loads each of the files, one dot per file. All files must load successfully.

2.5 Step 4: Initializing Software

After successfully completing the down-line load, the following message is displayed on the operator panel. This display indicates that software initialization has started.

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Digital Equipment Corp.

Then, the operator panel display shows the following message:

Please Wait...
Initializing...

2.6 Step 5: Printing a Start-Up Page

If enabled, the host sends the start-up page to the printer (Figure 2–1). The system manager can disable printing the start-up page with the following procedure:

```
$ SET DEFAULT LPS$SUPPORT
$ RENAME LPS_STARTPAGE.PS LPS_STARTPAGE_SAVE.PS
```

For additional information read the *PrintServer Supporting Host for VMS Management/User's Guide* or the *PrintServer Supporting Host for ULTRIX Management/User's Guide*.

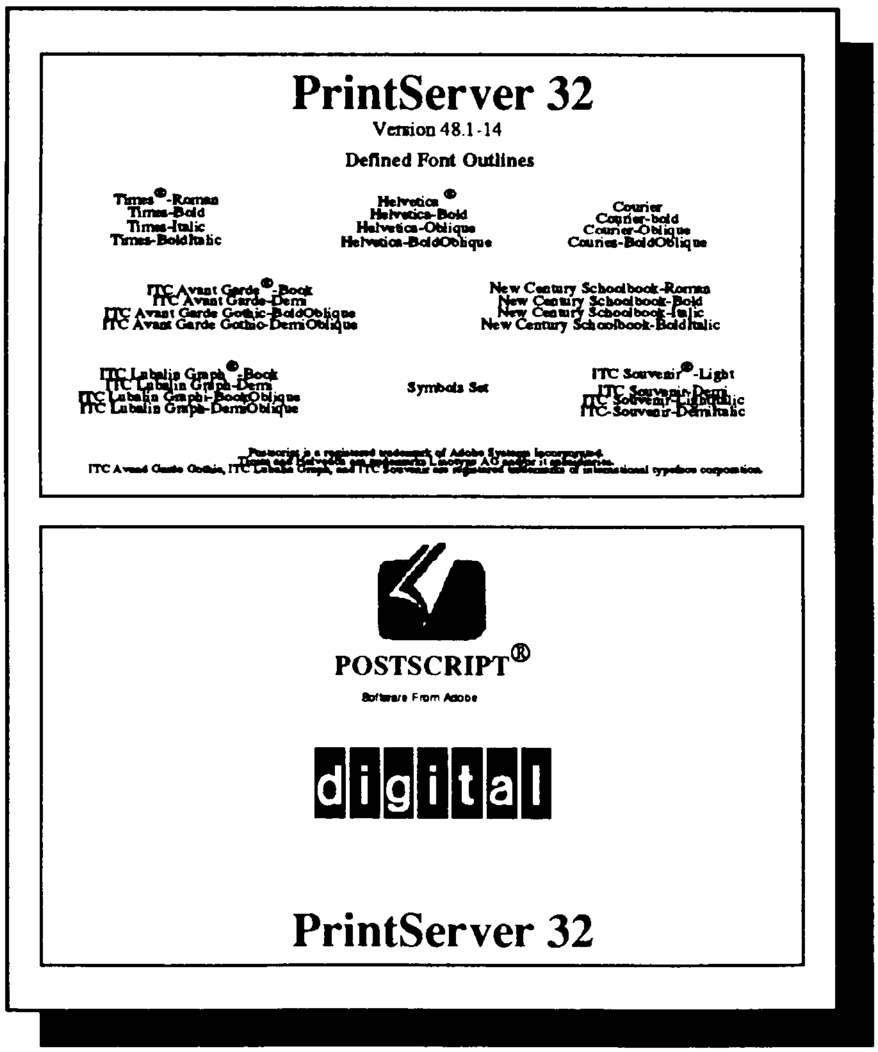
2.7 Step 6: Displaying the Ready Status

Finally, the operator panel displays one of the following messages:

Ready
or
Single Job Mode-
Press Resume To Continue

2.7 Step 6: Displaying the Ready Status

Figure 2–1 Start-Up Page



PrintServer 32

Version 48.1-14

Defined Font Outlines

Times®-Roman
Times-Bold
Times-Italic
Times-BoldItalic

Helvetica®
Helvetica-Bold
Helvetica-Oblique
Helvetica-BoldOblique

Courier
Courier-bold
Courier-Oblique
Courier-BoldOblique

ITC Avant Garde®-Book
ITC Avant Garde-Demi
ITC Avant Garde Gothic-BoldOblique
ITC Avant Garde Gothic-DemiOblique

New Century Schoolbook-Roman
New Century Schoolbook-Bold
New Century Schoolbook-Italic
New Century Schoolbook-BoldItalic

ITC Lubalin Graph®-Book
ITC Lubalin Graph-Demi
ITC Lubalin Graph-BookOblique
ITC Lubalin Graph-DemiOblique

Symbols Set

ITC Souvenir®-Light
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PrintServer 32

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3

Switches and Indicators

This chapter describes the switches and indicators on the following components of the PrintServer 32:

- Operator panel
- Power supply
- Controller board
- Print engine drive board
- Duplexer/LCIT drive board

3.1 Operator Panel Keys and Indicators

The operator panel is used to display information and enter commands. The operator panel is a microcomputer system that can communicate with the controller or the engine drive board. In normal or field test mode (FTM) operation, the controller board operates the panel. When using the engine board menus, the engine drive board operates the panel. See Chapter 12 for information about the engine drive board menus.

In operational mode, the operator panel displays print job status and tells the user to clear jams, close panels, attend to the input/output trays, or call the operator or Customer Services. In FTM, the operator panel is used to run the controller self-test and input field test commands, such as print test sheet. Figure 3–1 shows the operator panel elements. Figure 3–1 and Table 3–1 details the major areas of the operator panel.

3.1 Operator Panel Keys and Indicators

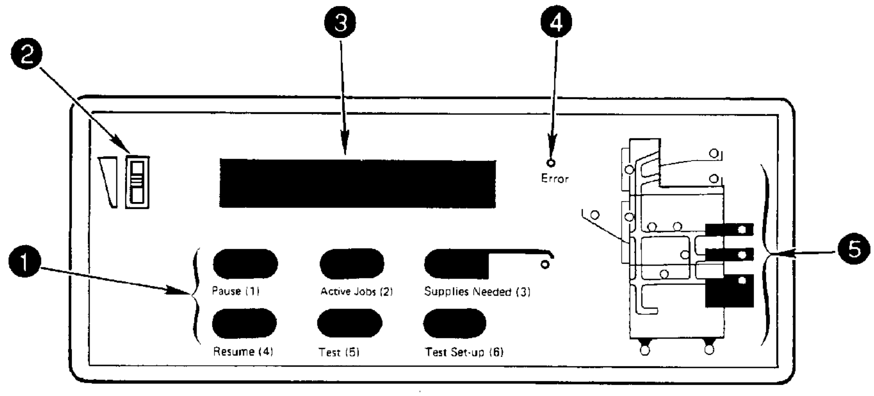

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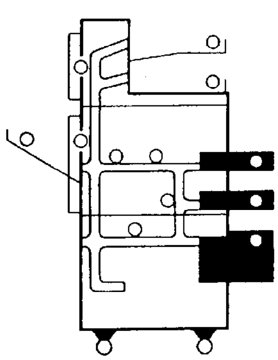
Table 3–1 Operator Panel Keys and Indicators

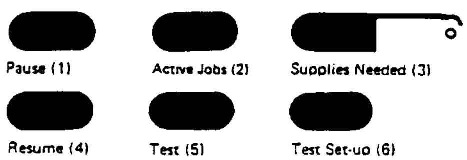
	Key or Indicator	Function
❶	Keypad	In operational and test set-up modes, the keys perform functions, such as Pause or Resume. See the next illustration for more information.
❷	Contrast switch	Adjusts the contrast of the LCD message display.
❸	LCD display	Displays the status of the printer.
❹	Error indicator	The printer requires attention. The LCD and graphic displays show the error message and location of the problem.
❺	Graphic display	Shows jam locations and overflowing or empty stacks and trays. See second illustration below for more information.



The graphics panel lights to attract the operator's attention and to direct their attention to the following:

- The input/output tray indicators light **green** to show which tray is selected.
- The input/output tray indicators light **amber** when a tray is full.
- The paper path indicators light **amber** to show the location of a jam or interlock.

3.1 Operator Panel Keys and Indicators



In operational and test set-up modes, the keys perform functions, such as Pause or Resume.

In FTM and engine drive board modes the keys translate to numbers.

Pause [1] Places the printer in the paused (off-line) state to stop printing functions. When the Pause key is pressed, the following two lines are displayed:

- **Please wait...**
- **Paused — Press Resume to Continue**

Active Jobs [2] displays the current node, user name, server job number, and time the job began.

Supplies Needed [3] key and indicator. When the amber indicator lights, the toner supply is low, the cleaning unit is full, or scheduled maintenance is needed. Press the Supplies Needed key to display the waiting message. If there is more than one message, the LCD display alternately blinks each message.

Resume [4] in operational mode, toggles the printer from the off-line (Pause) state to the on-line (Ready) state.

In Single Job Mode, the Resume key processes the next print job.

Test [5] prints one single-sided copy of the engine drive board test pattern, shown in Figure 4–4. The printer must be paused (off line) to perform this function. Press this key during the power up self-test to disable the long rounding cycle during FTM.

Test Set-Up [6] in the Ready state, is inactive, when paused, it invokes the test set-up mode, so you can select test parameters.

3.2 Low-voltage Power Supply Indicators

Four LED indicators are mounted on the circuit board of the low-voltage power supply unit (PSU). The LEDs are wired to the power supply output terminals and light when the supply voltage is present.

To see the LEDs, open the front cover of the print engine and look through the slots of the PSU’s metal cabinet. If you see four glowing LEDs, the low-voltage PSU is working correctly. From the front to the rear of the print engine, the LEDs correspond to the following voltages:

+24 Volts
–12 Volts
+12 Volts
+5 Volts

3.3 Controller Board Indicators and Switches

After removing the board cage cover, you can see five LEDs mounted on the edge of the controller board. Four LEDs are yellow; one LED is green.

The green LED indicates the low-voltage PSU is supplying +5 volts DC.

The four yellow LED indicators on the controller board display a binary coded subtest number. Table 3–3 lets you decode the controller board LED display. The subtests run in the order listed.

During error-free operation, the LEDs quickly display a changing countdown as the subtests run. If a fatal error is detected, the subtest loops, causing the displayed subtest number to flash.

The four switches of the switchpack that is mounted on the controller board are disabled and the switches have no effect on the operation of the PrintServer 32 system. Table 3–2 shows the shipping configuration of the switches. The choice between ULTRIX and VMS operating system is set by parameters in the supporting host.

Table 3–2 Controller Board Switch Pack

1	2	3	4	Action
Off	On	On	On	Normal operational position.

3.3 Controller Board Indicators and Switches

Table 3–3 Controller Board Indicators

LEDs Display	Note
1111	The restart (RST) test is invoked at power-up or by a Field Test Mode command
0001	Controller board ROM checksum test
0010	MicroVAX system support chip (SSC) test(s)
0011	Controller board CPU test
0100	Controller board floating point unit (FPU) test
0101	Memory sizing test
0110	Memory data/addressing test
0111	CPU cache test
1000	Memory OR function tests
1001	Print engine data interface (PDI) tests
1010	Direct memory access (DMA) test
1011	Local area network controller exerciser (LANCE) tests
1100	Electrically erasable programmable read only memory (EEPROM) tests
1101	Engine c/s external loopback test
1110	Operator's panel external loopback test
1111	Engine status tests
0001	Field test mode (FTM) functions

LED display of 1 means the LED is illuminated.
The left LED is the most significant digit (MSD).
The 1111 (F) and 001 (1) controller board displays are used twice.

3.4 Print Engine Drive Board Switches

The eight switch switchpack mounted on the engine drive board is labeled DPS201. Table 3–4 shows the configuration of the DPS201 switches for normal online operation. Chapter 12 shows how to configure the DPS201 switches to invoke the engine drive board menus.

The engine drive board menus are used for adjusting the print margins or for reading the electronic maintenance counter. For the most part, the drive board switches should not be used in the field. You should use FTM error codes to service the printer.

Table 3–4 Print Drive Board Switches

1	2	3	4	5	6	7	8	Action
Off	Off	Off	Off	Off	Off	Off	Off	**Normal operational position.** All switches must be down or off for normal operation.

3.5 Duplex/LCIT Control Board Switches

The four bit switchpack, DPS402, mounted on the duplexer/LCIT control board is used for standalone testing of the cabinet unit; with the print engine removed.

All four switches must be set to the off position.

4

Field Test Mode (FTM)

This chapter describes the field test mode (FTM). FTM does the following:

- Invokes controller board and Ethernet tests
- Tests and exercises the print engine drive board
- Prints test patterns
- Boots the system
- Selects input and output trays

4.1 Entering and Exiting Field Test Mode (FTM)

To invoke the FTM mode you must power the printer on and wait for the 9,8 self test numbers to appear on the display.

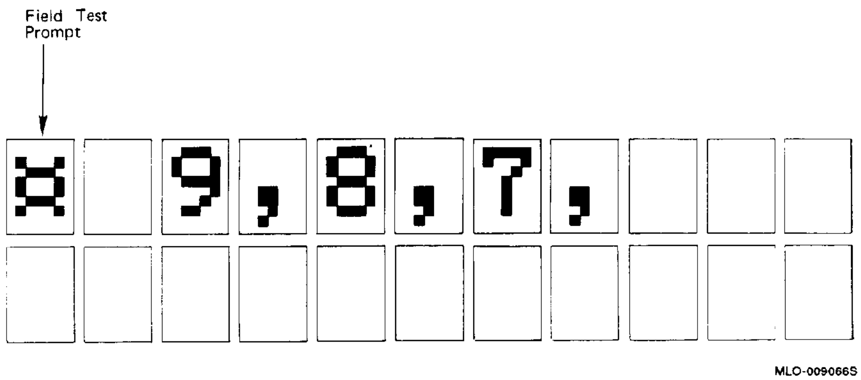
When the numbers appear press the **Pause [1]** key to make the FTM prompt appear Figure 4–1.

To bypass the upcoming memory and rounding tests press the **Active Jobs [2]** key. The error indicator will blink when the key is pressed. You cannot disable memory test after the self test number 6 is displayed or invoke FTM after the self-test numbers count down past zero. The term rounding means all motors and rollers run for a period of time.

Once FTM is invoked, you must wait for the self-test to end before you can enter commands.

4.1 Entering and Exiting Field Test Mode (FTM)

Figure 4–1 Field Test Prompt



If the self-test finds an error, it displays a self-test error message. If the self-test is successful, the countdown numbers are cleared and you can enter commands.

To exit FTM do one of the following:

- Power the printer off then on.
- Press the Resume [4] key as the countdown is displayed. The FTM prompt will disappear.
- Press keys 4 and 6 sequentially to boot the system. This command clears the FTM prompt and starts the boot process, described in Chapter 2.

4.2 Entering Commands

In FTM you use the six operator panel keys to enter commands. Keys [1], [2], [3], [4], and [5] are the command keys. Key [6] is the enter or return key. The following prompts may appear next to the FTM prompt:

Prompt	Meaning
<	Field test mode is ready to accept commands.
?	You entered a command incorrectly.
::	The command successfully executed.

4.3 Setup and Controller Tests

Table 4–1 lists the key sequences for entering query mode and performing various other functions.

Table 4–1 FTM Setup

To Perform This Action	Press Keys	Note
Initialize the print engine	2, 2, 6	Resets the printer to a default status and interrupt an in progress rounding test. You can hear the motors cycle on and off, and you see and hear the LCOT offset motors jog left and right.
Invoke query mode	2, 3, 6	See Chapter 5.
Update the operator panel	2, 4, 6	Obtain and display up-to-date engine status on the LCD and graphic displays of the operator's panel. Update is non-automatic. Old status is erased.
Clear maintenance request 1 Clear maintenance request 2	2, 5, 6 2,5,1,6	After performing the scheduled Customer Services maintenance 1 or 2, you enter this command to clear the error message and enable the next period of operation. See Chapter 11 for information about the two maintenance requests.
Run bootstrap	4,6	Terminates the FTM mode, runs the power-up self test, and boots system. Same as powering off then on.

4.3 Setup and Controller Tests

Table 4–2 explains how to invoke the three internal diagnostics that reside in the PrintServer 32 controller and engine drive board.

Table 4–2 Invoking Diagnostics

To Run This Test	Press Keys	Note
Complete self-test (once)	1, 1, 6	The normal self-test countdown is displayed along with the Field Test Mode prompt.
Complete self-test (continuous)	1, 6	The countdown numbers appear on the display. Press Pause to stop.
Processor self-test (once)	1, 2, 6	Displays the 9, 8, :: countdown numbers.
Memory subtest (once)	1, 3, 6	Displays the amount of memory and countdown numbers, for example, 12M 7, 6, 5, 4, 3, 2, ::.
LANCE (once)	1, 4, 6	Runs the local area network controller exerciser (LANCE) and displays the 1:: countdown number. The DESTA must be correctly terminated. An Ethernet loopback must be installed if the DESTA is not used. An active Ethernet is not necessary.
Printer interface test	2, 6	Displays the 3, 2, :: countdown numbers and tests the communication between the controller and print engine drive boards. Also referred to as the PDI test.
Operator panel test	2, 1, 6	Shows test patterns on the indicators and displays of the operator's panel. When successfully complete the 0:: countdown number is displayed and the print engine is initialize.

4.4 Printing FTM Test Patterns

Table 4–3 shows how to print FTM test patterns and select input and output trays. When a full speed test pattern is selected, the paper path feeds and handles multiple sheets of paper. Several prints might appear after you press the pause key to stop continuous printing.

Table 4–3 Printing Test Patterns

To Print This Pattern	Press Keys	Note
Controller[1] board	3, 6	One, Simplex
Engine drive[2] board	3, 1, 1, 6	Continuous, simplex, full speed.
Engine drive[2] board	3, 1, 6	One simplex print
Engine drive[2] board	3, 2, 6	One duplex print
Engine drive[2] board	3, 3, 6	Continuous, simplex (Press Pause to stop)
Engine drive[2] board	3, 4, 6	Continuous, duplex (Press Pause to stop)
Controller[1] board	3, 5, 6	Continuous, simplex (Press Pause to stop)
To Select This Tray	**Press Keys**	**Note**
Upper cassette Lower cassette LCIT Upper LCOT Lower LCOT Side tray	4, 1, 6 4, 2, 6 4, 3, 6 5, 1, 6 5, 2, 6 5, 3, 6	The graphic panel indicators glow green to show selected input and output. An amber indicator means an error condition associated with that input or output. For example, no cassette installed or side tray up. Error conditions on nonselected devices will not inhibit printing.

[1]Figures 4–2 and 4–3 show the A and B controller board patterns

[2]Figure 4–4 shows the engine drive board pattern

4.4 Printing FTM Test Patterns

Figure 4–2 shows the controller board test pattern, which resides on the controller board ROM memory.

Figure 4–2 Controller Board Test Pattern A

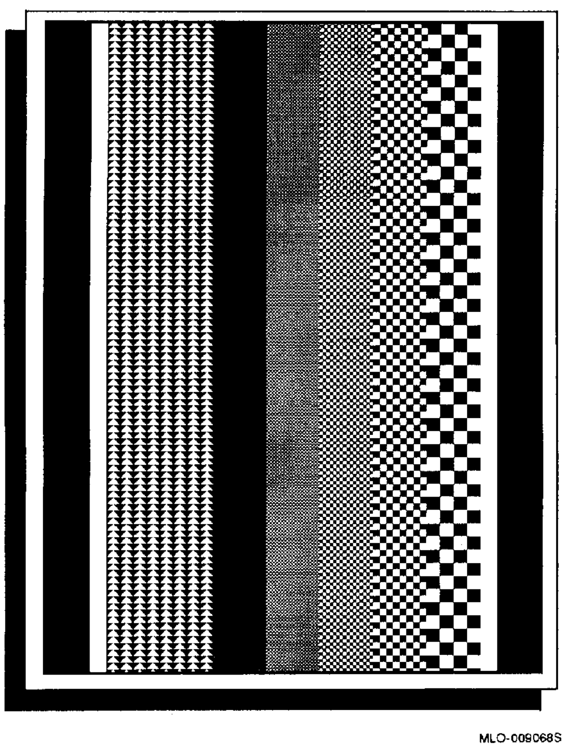
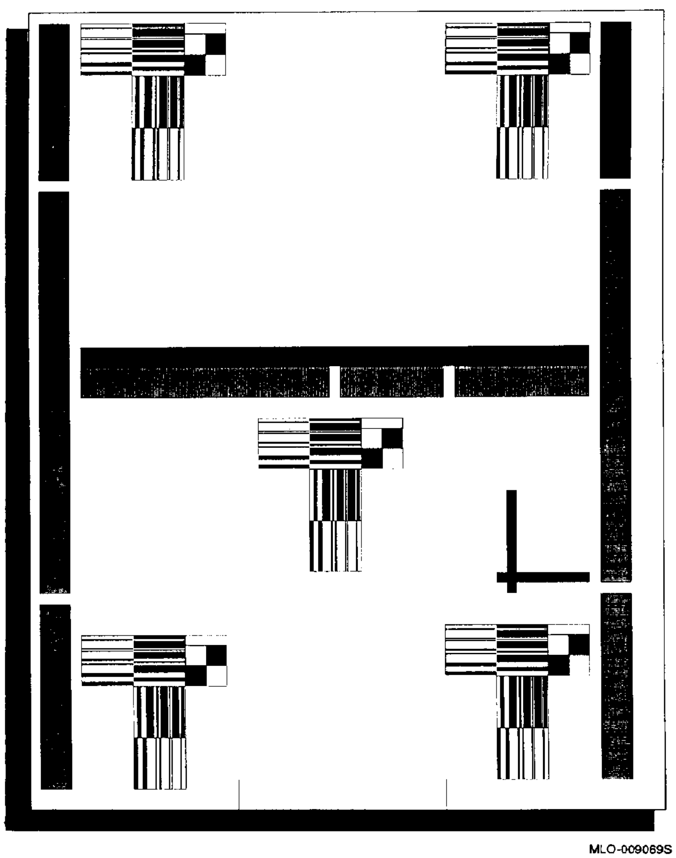


Figure 4–3 shows a second controller board pattern. See Chapter 9 to use this pattern as a test for print quality.

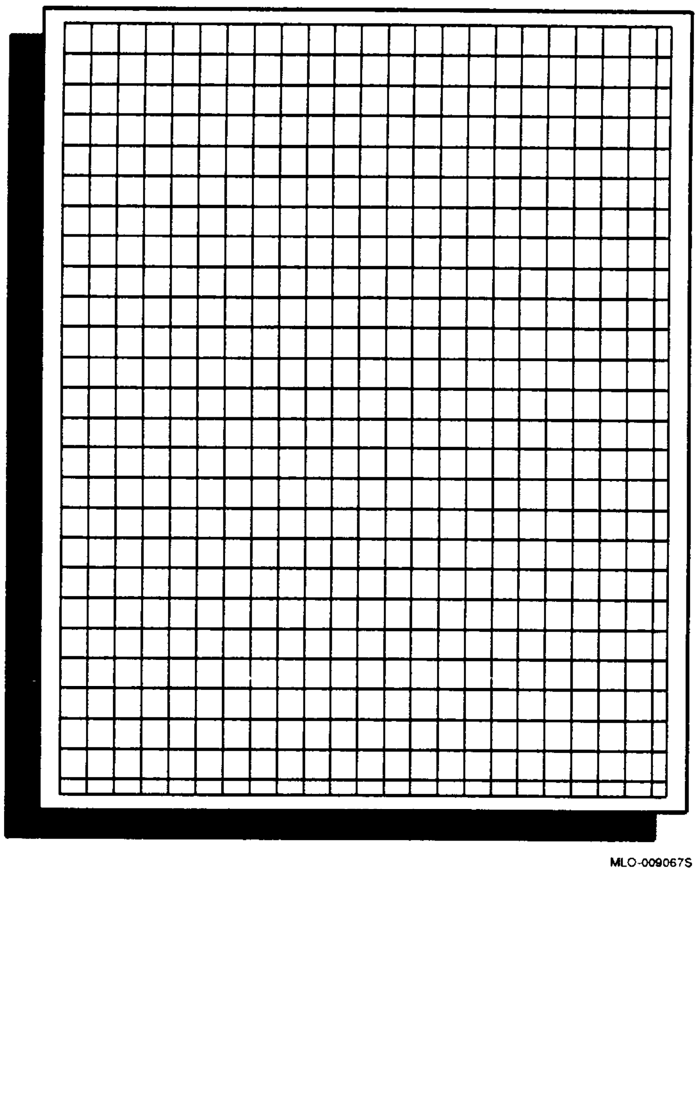
Figure 4–3 Controller Board Test Pattern B



4.4 Printing FTM Test Patterns

Figure 4–4 shows the engine drive board test pattern, which resides on the print engine drive board.

Figure 4–4 Engine Drive Board Test Pattern



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5

FTM Query Mode

This chapter describes how to invoke, operate, and read the PrintServer 32 FTM query mode. Through the query Mode you can obtain and display the Nth status bytes, a series of data bytes sent to the controller board from the print engine drive board. The bytes are hexadecimally numbered and are displayed in sequential order starting with byte N00 and ending with byte N0F.

5.1 Invoking Query Mode

The query mode runs under the field test mode (FTM) described in Chapter 4. Use the following procedure to invoke the query mode:

1. Power up the printer.
2. During the countdown numbers Press the **Pause [1]** to invoke FTM and **Active Jobs [2]** to bypass the memory and rounding tests.
3. Press keys **2, 3, and 6** to invoke the query mode and obtain and display N00. Press any key to obtain and display the next byte. The graphic panel status is updated after the N0F byte is displayed.

   The status display appears as follows:
   N00 bbbbbbbb
   BIT #76543210

   Where:

   N = Nth byte designator.
   00 = hexadecimal byte number.
   b = 1/0 setting.
   7 to 0 = bit weights.

5.2 Reading the Query Bytes and Bits

You can spot a problem by viewing the Nth status bytes. Each bit is set to one or zero by the engine drive board. The controller board reads and displays each byte.

If the bit is set to 0, the condition is normal, operational, or not significant. If the bit is set to 1, you should investigate why.

Some bits, however, are always set to 0. Those bits are marked not used.

For example, if bit 1 of byte 4 is set to 1, the LCIT tray motor error signal is asserted and the motor will not turn on.

Always view and evaluate all sixteen status bytes at a time.

Tables 5–1 through 5–15 provide a brief explanation of each bit in the sixteen query bytes. The sections pointed to are troubleshooting FIPs and provide a more detailed explanation of the status.

Table 5–1 Byte N00, General Status

Bit	If This Bit Is Set to 1...	Refer to Section...
	Bits 7–2 are Not used.	
1	The printer is in the nonready or busy state.	Informational
0	The engine drive board test pattern video generator is on.	Informational

Table 5–2 Byte NO1, Warm-up Status

Bit	If This Bit Is Set to 1...	Refer to Section...
	Bits 7, 6, and 5 are not used	
3	Main charge wire cleaning cycle in progress.	7.14
2	The printer is rounding, an operational mode where all the motors and fans are run and tested. You can hear the printer clicking and whirring.	Informational
1	The printer is warming up.	Informational
0	The engine and LCOT motors are running.	Informational

Table 5–3 Byte NO2, Fault Status

Bit	If This Bit Is Set to 1...	Refer to Section...
	Bit 7 is not not used.	
6	Fatal Charge wire cleaning motor error.	7.14
5	LCOT eject motor error	7.10
4	An interlock error has occurred.	7.9
3	The low-voltage PSU error signal is set.	7.7
2	The main motor will not operate.	7.6
1	The development motor will not operate.	7.5
0	A print engine drive board error is detected.	7.4

Table 5–4 Byte NO3, Engine Fault Status

Bit	If This Bit Is Set to 1...	Refer to Section...
	Bit 7 is not used.	
6	The fusing unit thermistor is broken.	7.18
5	The fusing temperature is too high.	7.17
4	The fusing temperature is too low.	7.16
3	Excessive fuser current	7.15
2	The detector pulse is missing.	7.13
1	The polygon motor error is set.	7.12
0	The laser diode power error is set.	7.11

5.2 Reading the Query Bytes and Bits

Table 5–5 Byte NO4, LCIT Fault Status

Bit	If This Bit Is Set to 1...	Refer to Section...
	Bits 7, 6, 5, and 4 are not used.	
3	LCIT paper feed unit motor error	7.22
2	The engine drive board cannot communicate with the LCIT CPU.	7.21
1	The LCIT tray motor error is set.	7.20
0	LCIT CPU error	7.19

Table 5–6 Byte NO5, Duplexer Unit Status

Bit	If This Bit Is Set to 1...	Refer to Section...
	Bits 7 through 3 and bit 1 are not used.	
2	The engine drive board cannot communicate with the duplexer unit CPU.	7.21
0	Duplexer CPU error	7.19

Table 5–7 Byte NO6, Optional Equipment Status

Bit	If This Bit Is Set to 1...	Refer to Section...
REVIEWER'S Note:: *The OLCOT is not covered in this service guide*		

Table 5–8 Byte NO7, Open Cover Status

Bit	If This Bit Is Set to 1...	Refer to Section...
	Bits 7, 6, and 3 are not used.	
5	The duplex transport is open.	7.27
4	One of the LCIT covers is open.	7.26
3	–	–
2	The engine's left side cover is open.	7.25
1	The LCOT's left side cover is open.	7.24
0	The engine's front cover is open.	7.23

Table 5–9 Byte NO8, Motor Status

Bit	If This Bit Is Set to 1...	Refer to Section...
	Bits 7 through 4 are not used.	
3	The LCOT upper offset motor error is set.	7.29
2	The LCOT lower offset motor error is set.	7.29
1	The lower cassette motor error is set.	7.28
0	The upper cassette motor error is set.	7.28

5.2 Reading the Query Bytes and Bits

Table 5–10 Byte NO9, Input Tray Status

Bit	If This Bit Is Set to 1...	Refer to Section...
	Bit 7 is not used.	
6	Paper is detected in the duplexer unit.	Informational
5	The LCIT is busy.	Informational
4	The LCIT is out of paper.	7.33
3	The lower cassette is out of paper.	7.32
2	The upper cassette is out of paper.	7.32
1	The lower cassette is missing or not installed correctly.	7.31
0	The upper cassette is missing or not installed correctly.	7.31

Table 5–11 Byte NOA, Paper Output Tray Error

Bit	If This Bit Is Set to 1...	Refer to Section...
	Bits 7, 6, 5, and 4 are not used.	
3	The left side tray is full.	7.36
2	The LCOT upper tray is full.	7.35
1	The LCOT lower tray is full.	7.35
0	The left side tray is not lowered.	7.34

Table 5–12 Byte NOB, and Byte NOC Are Unused

	Bits 7–0 are not used.

Table 5–13 Byte NOD, Assemblies Missing

Bit	If This Bit Is Set to 1...	Refer to Section...
	Bits 7, 6, and 5 are not used.	
4	Nonfatal Cleaning motor error or main charger is removed.	7.14
3	The fusing unit is missing or not fully seated.	7.40
2	The cleaning unit is missing or not fully seated.	7.39
1	The OPC drum unit is missing or incorrectly mounted.	7.38
0	The development unit is missing or not fully seated.	7.37

Table 5–14 Byte NOE, User Maintenance Status

Bit	If This Bit Is Set to 1...	Refer to Section...
	Bit 7 is not used.	
6	The development unit is out of toner.	7.8
5	The cleaning unit is full.	7.43
4	100k user maintenance counter timeout. Reset by new OPC.	7.42
3	Change wire cleaning request.	7.14
2	Customer services maintenance 1 required.	7.41
1	Customer services maintenance 2 required	7.41
0	Cleaning unit full sensor	7.43

5.2 Reading the Query Bytes and Bits

Table 5–15 Byte NOF, Paper Mismatch or Buffer Status

Bit	If This Bit Is Set to 1...	Refer to Section...
	Bit 7 is not used.	
6	An incorrect paper path is selected.	Informational
5	The LCIT size dial has changed during printing.	7.46
4	The lower cassette paper size key changed during printing.	7.45
3	The upper cassette paper size key changed during printing.	7.45
2	The LCIT paper size dial is in the detent position.	7.47
1	The LCIT is incorrectly loaded.	7.49
0	The engine drive board command buffer is nearly full. The command buffer holds data used in routine status and handshaking functions between the controller board and engine drive board.	Informational

6 Start FIP and Display Messages

This chapter contains the start fault isolation procedure (start FIP) and lists error codes and messages by numeric, alphabetic, and class.

6.1 About the FIPs

The fault isolation procedures (FIPs) are a collection of yes/no flow charts and tables that provide a way to fix or ensure the correct operation of the hardware. If a problem exists the start FIP will isolate the problem and direct you to the next FIP.

Table 6–1 lists all the PrintServer 32 FIPs. The **bold** text is covered in this chapter.

Table 6–1 FIP Directory

Section	Explains
6.4.1	**Reading the Error Message**
6.2	**Step One**
6.3	**Start FIP**
7.1	Power/Panel FIP Operator Panel FIPs
8	Paper Jam FIPs
9	Print Quality FIPs

6.2 Step One

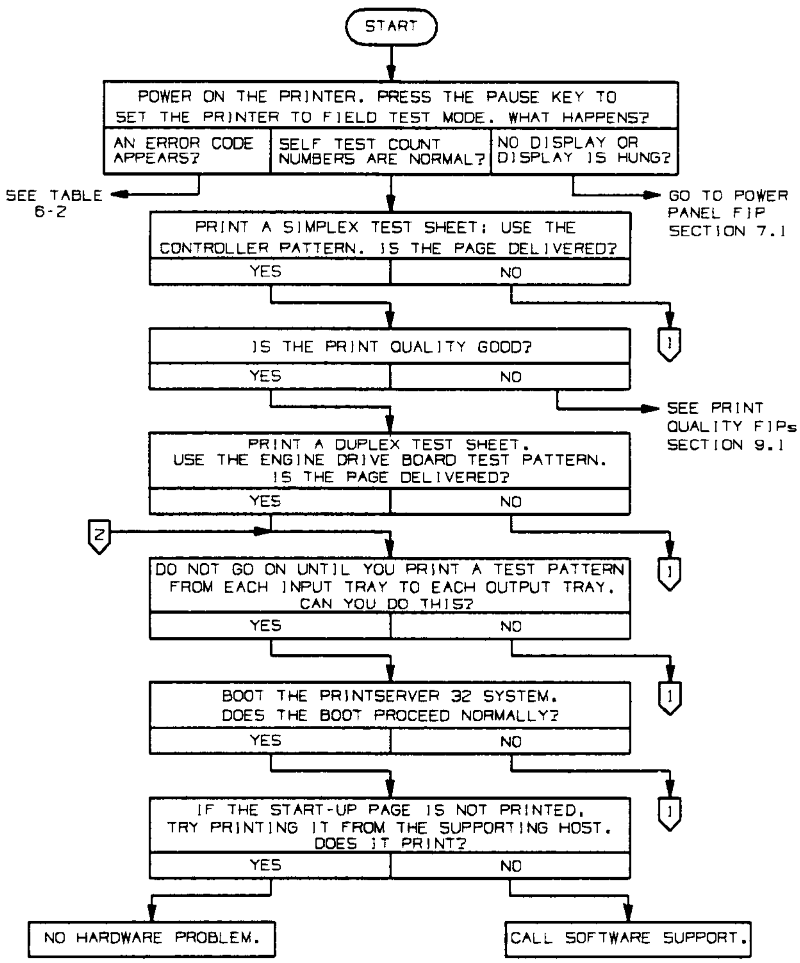
Before using the FIPs, read the following notes:

- Record the symptoms first, then recycle/reboot the printer.
- Perform the Section 6.3, Start FIP even if the problem goes away.
- Follow the FIPs in order. The printer is not fixed until you complete the start FIP with no errors.
- After fixing the original complaint, perform the TCC procedures listed in Appendix B.
- Keep the following in mind when the FIP tells you to check a signal or power supply voltage:
  - Unless otherwise stated, all voltage readings should be within ±5% of the stated value.
  - Voltage level “low” means 0 to +0.5V.
  - Voltage level “high” means 5V ±0.5V.
- When operating in field test mode (FTM) do the following to update the displayed status after each corrective step:
  1. Recycle the power or initialize the engine by pressing keys 2, 2, and 6.
  2. Update the operator panel by pressing keys 2, 4, and 6

6.3 Start FIP

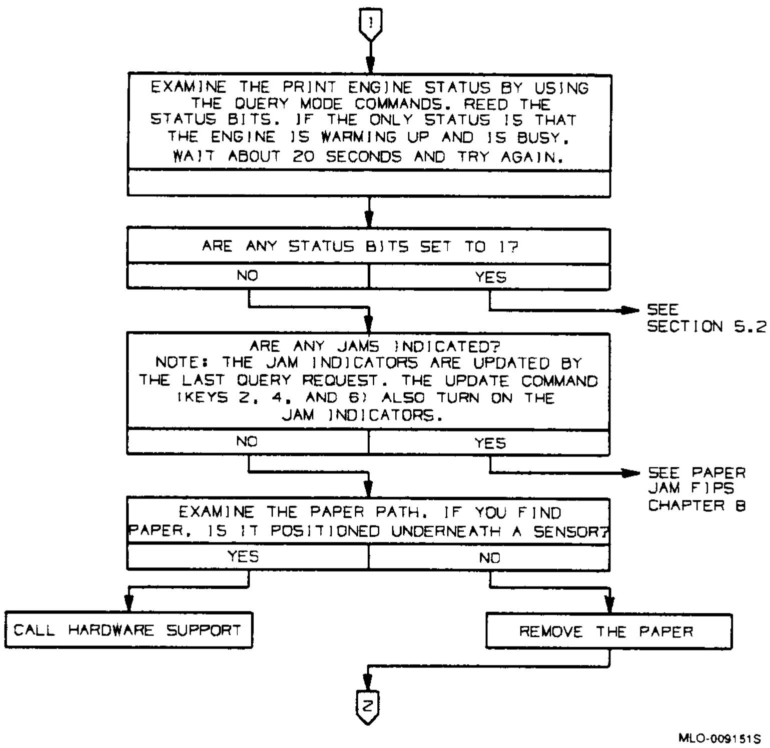
The following start point is the place to begin or to restart the PrintServer 32 fault isolation. Restarts become necessary if symptoms change or confusion occurs.

6.3 Start FIP


START
POWER ON THE PRINTER. PRESS THE PAUSE KEY TO SET THE PRINTER TO FIELD TEST MODE. WHAT HAPPENS?
AN ERROR CODE APPEARS?
SELF TEST COUNT NUMBERS ARE NORMAL?
NO DISPLAY OR DISPLAY IS HUNG?
SEE TABLE 6-2
GO TO POWER PANEL FIP SECTION 7.1
PRINT A SIMPLEX TEST SHEET; USE THE CONTROLLER PATTERN. IS THE PAGE DELIVERED?
YES
NO
1
IS THE PRINT QUALITY GOOD?
YES
NO
SEE PRINT QUALITY FIPs SECTION 9.1
PRINT A DUPLEX TEST SHEET. USE THE ENGINE DRIVE BOARD TEST PATTERN. IS THE PAGE DELIVERED?
YES
NO
2
1
DO NOT GO ON UNTIL YOU PRINT A TEST PATTERN FROM EACH INPUT TRAY TO EACH OUTPUT TRAY. CAN YOU DO THIS?
YES
NO
1
BOOT THE PRINTSERVER 32 SYSTEM. DOES THE BOOT PROCEED NORMALLY?
YES
NO
1
IF THE START-UP PAGE IS NOT PRINTED, TRY PRINTING IT FROM THE SUPPORTING HOST. DOES IT PRINT?
YES
NO
NO HARDWARE PROBLEM.
CALL SOFTWARE SUPPORT.

6.3 Start FIP

Figure 6–2 Start FIP (Cont.) Paper Path Jams or Boot Failure



6.4 Error Code Listing By FTM Messages

Table 6–2 lists all error messages by the descending value of the diagnostic error code. The full column directs you to the appropriate FIP. Non-diagnostic messages are at the rear of Table 6–2.

The following tables list the same information alphabetically by operational message classification:

- Table 6–4, Interlock Errors
- Table 6–5, Tray Errors
- Table 6–6, Miscellaneous Errors

6.4.1 Reading the Error Message

During an power up self-test or in Field Test Mode (FTM), the operator panel might display a diagnostic error messages in the following format:

TTXX.EEEE (Z)

Where: TT indicates the major group.
XX is an informational identification of the problem area.
EEEE is the unique error code for a particular component.
(Z) Is the first jam location number. See

01: Upper cassette feeding jam
02: Lower cassette feeding jam
03: LCIT feeding jam
04: Duplex feeding jam
05: Duplex transport jam
06: Cabinet jam
07: Option LCOT jam
11: Transport jam (engine)
12: Engine exit to LCOT jam
13: LCOT eject jam
14: Engine exit to cabinet jam
15: Jam in fusing unit
20: Fatal error jam
21: Cover open jam

6.4 Error Code Listing By FTM Messages

Table 6–2 Error Code Listing by FTM Message

Display		Query	Description	
Diagnostic	Operational	Byte–bit	Brief	Full
00xx.???? to 0Exx.????	—	—	Any error code in this range indicates a controller, memory board, or Ethernet error. (See below)	7.2
0Bxx.????	—	—	One of the following Ethernet failures: 0B01.1002—address ROM 0B01.7004—ThinWire 0B01.7008—terminator 0B01.700A—Blown Ethernet fuse or bad low-voltage power supply. 0B01.7010—Ethernet	7.2
10xx.0002 10xx.0004 10xx.0006 10xx.0008 10xx.000A 10xx.000C 10xx.000E 10xx.0010 10xx.0012	—	—	When one of these messages is displayed, a failure of the controller, connection or operator (or front)panel is indicated.	7.3
0Fxx.????	—	—	Find the identical 11xx.???? error code below.	—
11xx.0020	**Hardware Error 20 Call Customer Services**	N2–0	Print engine CPU error	7.4
11xx.0021	**Hardware Error 21 Call Customer Services**	N2–1	Development motor error	7.5

(continued on next page)

Table 6–2 (Cont.) Error Code Listing by FTM Message

Display		Query	Description	
Diagnostic	Operational	Byte–bit	Brief	Full
11xx.0022	**Hardware Error 22 Call Customer Services**	N2–2	Main motor error	7.6
11xx.0023	**Hardware Error 23 Call Customer Services**	N2–3	Low-voltage power supply error	7.7
11xx.0024	**Hardware Error 24 Call Customer Services**	N2–4	+24V Cover interlock error	7.9
11xx.0025	**Hardware Error 25 Call Customer Services**	N2–5	Main eject motor error	7.10
11xx.0026	**Hardware Error 26 Call Customer Services**	N2–6	Fatal charge clean motor	7.14
11xx.0030	**Hardware Error 30 Call Customer Services**	N3–0	Laser diode power error	7.11
11xx.0031	**Hardware Error 31 Call Customer Services**	N3–1	Polygon motor error	7.12
11xx.0032	**Hardware Error 32 Call Customer Services**	N3–2	Detector pulse missing	7.13
11xx.0033	**Hardware Error 33 Call Customer Services**	N3–3	Excessive fuser current	7.15
11xx.0034	**Hardware Error 34 Call Customer Services**	N3–4	Fuser temperature too low	7.16
11xx.0035	**Temperature Too High POWER DOWN IMMEDIATELY!**	N3–5	Fuser temperature too high	7.17
11xx.0036	**Hardware Error 36 Call Customer Services**	N3–6	Fuser thermistor broken	7.18
11xx.0040	**Hardware Error 40 Call Customer Services**	N4–0	LCIT CPU error	7.19
11xx.0041	**Hardware Error 41 Call Customer Services**	N4–1	LCIT lift (elevator) motor error	7.20
11xx.0042	**Hardware Error 42 Call Customer Services**	N4–2	LCIT communication error	7.21
11xx.0043	**Hardware Error 43 Call Customer Services**	N4–3	LCIT feed unit motor error	7.22

(continued on next page)

6.4 Error Code Listing By FTM Messages

Table 6–2 (Cont.) Error Code Listing by FTM Message

Display		Query	Description	
Diagnostic	Operational	Byte–bit	Brief	Full
11xx.0050	**Hardware Error 50 Call Customer Services**	N5–0	Duplexer CPU error	7.19
11xx.0052	**Hardware Error 52 Call Customer Services**	N5–2	Duplexer communication error	7.21
11xx.0060	**Hardware Error 60 Call Customer Services**	N6–0	Optional equipment error	—
11xx.0062	**Hardware Error 62 Call Customer Services**	N6–2	Optional equipment error	—
11xx.0070	**Close Front Cover**	N7–0	Print engine front cover open	7.23
11xx.0071	**Close upper side door**	N7–1	LCOT Cover Open	7.24
11xx.0072	**Close Lower Side Door**	N7–2	Print Engine Side Cover Open	7.25
11xx.0074	**Close Paper Tray Door**	N7–4	LCIT cover is open	7.26
11xx.0075	**Open Cabinet Door, Raise Duplex Transport Guide**	N7–5	Duplex guide unlatched	7.27
11xx.0080	**Reinsert Upper Cassette**	N8–0	Upper Cassette Motor Error	7.28
11xx.0081	**Reinsert Lower Cassette**	N8–1	Lower cassette motor error	7.28
11xx.0082	**Hardware Error 82 Call Customer Services**	N8–2	LCOT lower offset motor error	7.29
11xx.0083	**Hardware Error 83 Call Customer Services**	N8–3	LCOT upper offset motor error	7.29
11xx.00D0	**Interlock Error 3 See Operator Guide**	ND–0	Developer unit absent	7.37
11xx.00D1	**Interlock Error 2 See Operator Guide**	ND–1	OPC drum absent	7.38
11xx.00D2	**Interlock Error 1 See Operator Guide**	ND–2	Cleaning unit absent	7.39
11xx.00D3	**Interlock Error 4 See Operator Guide**	ND–3	Fusing unit absent	7.40
11xx.00D4	–	ND–4	Main charger cleaning unit is missing	7.14

(continued on next page)

Table 6–2 (Cont.) Error Code Listing by FTM Message

Display		Query	Description	
Diagnostic	Operational	Byte–bit	Brief	Full
11xx.00E0	None	NE-5	Cleaning unit full sensor. (200 prints left before 11xx.00E5 message)	7.43
11xx.00E1 11xx.00E2	**Call Customer Services Maintenance 1 (or 2) Required**	NE–1 NE–2	320k or 2400k maintenance is needed	7.41
11xx.00E3	None	NE–3	Charge wire cleaning request	7.14
11xx.00E4	**Perform User Maintenance**	NE–4	100k maintenance counter, reset by new OPC drum	7.42
11xx.00E5	**Cleaning Unit Full See Operator Guide**	NE–5	Cleaning unit is full (immediate printer shutdown)	7.43
11xx.00E6	**Add Toner and Clean Components**	NE–6	Toner level is low. [2]	7.8
11xx.00E7	???	???	???	???
11xx.00E8	???	???	???	???
11xx.0134	**Hardware Error 134 Re-insert main charger**	ND–4	First occurrence is nonfatal. Main charger might not be installed. Second occurrence is fatal.	7.14
11xx.1002	(No message)	—	Protocol timeout	7.44
11xx.1004	(No message)	—	Init error—PE fault	–
11xx.1006	(No message)	—	Init error—LCIT fault	–
11xx.1008	(No message)	—	Init error—DPX fault	–
11xx.100C	(No message)	N4–2	Init error—LCIT Comm error	7.21
11xx.100E	(No message)	N5–2	Init error—DPX Comm error	7.21
11xx.2002	(No message)	—	Set input tray failed[3]	–

[2] Informational message only.

[3] An unknown malfunction within the printer causes this message which obscures other more concrete messages. Remove all jammed paper, use the query mode to scan for the malfunction, or power down the printer and perform the start FIP, as shown in Section 6.3.

(continued on next page)

6.4 Error Code Listing By FTM Messages

Table 6–2 (Cont.) Error Code Listing by FTM Message

Display		Query	Description	
Diagnostic	Operational	Byte–bit	Brief	Full
11xx.2004	(No message)	—	Set output tray failed[2]	–
11xx.2006 11xx.2008 11xx.200A	(No message)	—	Printer is busy.[3]	–
11xx.200C	(No message)	—	Early page eject[3]	–
11xx.200E	(No message)	—	Set test mode failed[3]	–
11xx.2010	(No message)	—	Unexpected reply from engine[3]	–
11xx.2012	(No message)	—	Error during printing[3]	–
11xx.2014	(No message)	—	Set duplex mode failed [3]	–
11xx.2016	(No message)	—	DPX print not accepted [3]	–
11xx.2018	(No message)	—	Timeout waiting for page eject[3]	–
11xx.2020	(No message)	—	Failed to reset test mode[3]	–
11xx.2022	(No message)	—	Failed to reset duplex mode[3]	–
11xx.2024	(No message)	NE–2	Failed to reset 320K request[3]	7.41
11xx.2026	(No message)	—	Not enough memory[3]	–
11xx.2028	(No message)	NE–1	Failed to reset 2400K request[3]	7.41
11xx.8083	(No message)	N2–?[3] N3–?[3]	Engine unit fault received	–
11xx.8085	(No message)	N4–?[3]	LCIT unit fault received	–
11xx.8087	(No message)	N5–?[3]	Duplex unit fault received	–

[2]Informational message only.

[3]An unknown malfunction within the printer causes this message which obscures other more concrete messages. Remove all jammed paper, use the query mode to scan for the malfunction, or power down the printer and perform the start FIP, as shown in Section 6.3.

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Table 6–2 (Cont.) Error Code Listing by FTM Message

Display		Query	Description	
Diagnostic	Operational	Byte–bit	Brief	Full
11xx.8089	–	–	Option unit failure	—
11xx.808B	**Close Front Cover**	N7–0	Front cover open event received	7.23
11xx.808D	**Close Upper Side Door**	N7–1	LCOT cover open event received	7.24
11xx.808F	**Close Lower Side Door**	N7–2	Side cover open event received	7.25
11xx.8091	**Close Paper Tray Door**	N7–4	LCIT cover(s) open event received	7.26
11xx.8093	**Open Cabinet Door, Raise Duplex Transport Guide**	N7–5	Duplex transport unlatched event	7.27
11xx.8095	–	–	Optional equipment error	—
11xx.8097 11xx.8099	**Reinsert Upper (or Lower) Cassette**	N8–0 N8–1	Cassette motor error	7.28
11xx.809B 11xx.809D	**Hardware Error 82** or **83 Call Customer Services**	N8–2 N8–3	Upper (or lower) LCOT offset motor error	7.29
11xx.809F	–	—	Optional equipment error	—
11xx.80A1	(No message)	—	Undefined event sent from engine	**???**
11xx.80A3	(Instructional messages with graphics display)	—	Jam just occurred event received	6.3
11xx.80A5	(Instructional messages with graphics display)	—	Jam location just fixed event	**???**
11xx.80B1	**Wrong Size Paper In upper Cassette**	NF–3	Upper cassette	7.45
11xx.80B3	**Wrong Size Paper In Lower Cassette**	NF–4	Lower cassette	7.45

(continued on next page)

6.4 Error Code Listing By FTM Messages

Table 6–2 (Cont.) Error Code Listing by FTM Message

Display		Query	Description	
Diagnostic	Operational	Byte–bit	Brief	Full
11xx.80B5	**Wrong Size Paper In Paper Tray**	NF–5	LCIT paper size error event	7.46
11xx.80C1	(No message)	NF–6	Incorrect paper path is selected[2]	**???**
11xx.80C3	(No message)	—	Paper remains in system event	—
11xx.80C5 11xx.80C7 11xx.80C9	–	–	Paper in the upper or lower cassettes or in the LCIT is too short.	7.30
11xx.80CD	**Set Paper Size Dial**	NF–2	LCIT selection dial incorrectly set	7.47
11xx.80CF	**Align Paper Flush Against Back Of Tray**	NF–1	LCIT paper loading position incorrect	7.49
11xx.80D7	(Various messages)	ND–?[3]	Missing components in print engine.[3]	—
11xx.80D9	Perform User Maintenance	NE–4	100K user maintnenace is needed.	7.42
11xx.80E3	(No message)	N9–5	LCIT is not ready[2]	–
11xx.80E5	**Output Tray Full**	NA–3	Side eject tray is full	7.36
—	**?54–Retrying bootstrap**	—	Failure to initiate system boot.	7.50
—	**?55–Volunteer Provided Unknown File**	—	A host responded with incorrect boot file.	7.50
—	**?4–Fatal Software Error Reboot Or Cycle Power**	—	Controller error occurred during boot process.	7.48

[2]Informational message only.

[3]An unknown malfunction within the printer causes this message which obscures other more concrete messages. Remove all jammed paper, use the query mode to scan for the malfunction, or power down the printer and perform the start FIP, as shown in Section 6.3.

6.5 Operational Messages

Operational messages occur during the normal day-to-day running of the PrintServer 32. The printer is booted, online, and is processing the customer's printing or commands. The messages alert the operator or user to an ongoing or impending condition. See the explanation column in Table 6–3 to interpret the operational messages.

Table 6–3 Operational Messages

Message	Explanation
Print Engine Is In Warm-up State	The printer is warming up and cannot be used. This process takes approximately 2.5 minutes from a cold start. This occurs when you power-up or when a door or cover is closed.
Ready	The printer is functioning correctly and is waiting for a job to process.
Processing	The printer is processing one or more jobs.
Printing	The printer is printing a page.
Paused	The printer is in the off-line state caused when the Pause key was pressed. In the paused state, you can print test sheets and perform the operator functions listed in the operator's manual.
Single Job Mode — Press Resume To Continue	Single Job Mode is set by the remote server management utility on the supporting host. When the mode is invoked, press the Resume key to process each print job. Consult the *PrintServer Supporting Host for VMS Management/User's Guide* or *PrintServer Supporting Host for ULTRIX Management/User's Guide* for additional information about using Single Job Mode.
Deleting Current Job	The printer is deleting the current job from processing.
Perform User Maintenance	The printer needs various components cleaned or replaced to maintain print quality. See the individual kit guides for user maintenance procedures. See error code 11xx00E0 or 11xx.00E4 in Table 6–2 for trouble shooting information.
Call Customer Services Maintenance 1 (or 2) Required	The printer needs various components cleaned or replaced to maintain print quality. See Chapter 11 for maintenance procedures. See error code 11xx.00E2 in Table 6–2 for troubleshooting information.

6.6 Interlock Error Messages

Table 6–4 alphabetically lists the interlock messages that appear under operational, query, and diagnostic modes. The same information is listed numerically by diagnostic error code in Table 6–2.

Under normal operation the message clears automatically when the indicated door, drawer, or paper path section is closed. If the message fails to clear, power down the printer and enter the diagnostic mode. Turn to Section 6.3, Start FIP, for authorized assistance.

Table 6–4 Interlock Errors

Display		Query	Description	
Operational	Diagnostic	Byte–bit	Brief	Full
Close Front Cover	11xx.0070	N7–0	Print engine front cover open	7.23
Close Lower Side Door	11xx.0072	N7–2	Print engine side cover open	7.25
Close Paper Tray Door	11xx.0074	N7–4	LCIT cover(s) open	7.26
Close Upper Side Door	11xx.0071	N7–1	LCOT cover open	7.24
Hardware Error 34 Call Customer Services	11xx.0034	N3–4	Fuser interlock causing temperature too low	7.16
Interlock Error 1 See Operator Guide	11xx.00D2	ND–2	Cleaning unit absent	7.39
Interlock Error 2 See Operator Guide	11xx.00D1	ND–1	OPC drum absent	7.38
Interlock Error 3 See Operator Guide	11xx.00D0	ND–0	Developer unit absent	7.37
Interlock Error 4 See Operator Guide	11xx.00D3	ND–3	Fusing unit absent	7.40
Open Cabinet Door, Raise Duplex Transport Guide	11xx.0075	N7–5	Duplex guide unlatched	7.27

6.6.1 Sensing Interlock Conditions

Interlocks are sensed by photointerruptor type sensors, mechanically actuated switches, or in the case of the fusing unit, a hardwire connection that is made when the fusing unit is fully installed.

Dual-pole switches usually serve two different interlock circuits. One pole shorts the controller board signal to ground. The second pole is wired in series with the +24-volt power supply that feeds the print engine motors.

The fusing heater switch uses both poles to break the AC power source for the fusing heater which causes the "Hardware Error 34" messages shown in Table 6–4 and Table 6–2.

6.7 Tray Error Messages

Table 6–5 alphabetically lists the tray messages that appear under operational and diagnostic mode. The same information is listed numerically by diagnostic display on Table 6–2.

Tray errors clear automatically when the operator corrects the condition. If the message fails to clear, power down the printer and enter the diagnostic mode. Turn to the start FIP in Chapter 5 for authorized assistance.

Table 6–5 Tray Errors

Display		Query	Description	
Operational	Diagnostic	Byte–bit	Brief	FULL
Add Paper	—	N9–2	Upper cassette empty	7.32
Add Paper	—	N9–3	Lower cassette empty	7.32
Add Paper	—	N9–4	LCIT is empty or not raised	7.33
Align Paper Flush Against Back Of Tray	11xx.80CF	NF–1	LCIT paper loading position incorrect	7.49
Insert Paper Cassette	—	N9–0	Upper cassette missing	7.31
Insert Paper Cassette	—	N9–1	Lower cassette missing	7.31
Open Side Tray	—	NA–0	Side output tray is not set	7.34
Output Tray Full	—	NA–1	Lower output tray full	7.35
Output Tray Full	—	NA–2	Upper output tray full	7.35
Output Tray Full	11xx.80E5	NA–3	Side tray is full	7.36
Reinsert Upper Cassette	11xx.0080 11xx.8097	N8–0	Upper cassette motor error	7.28
Reinsert Lower Cassette	11xx.0081 11xx.8099	N8–1	Lower cassette motor error	7.28
Set Paper Size Dial	11xx.80CD	NF–2	LCIT selection dial incorrectly set	7.47
Wrong Size Paper In Lower Cassette	11xx.80B3	NF–4	Lower cassette	7.46
Wrong Size Paper In Upper Cassette	11xx.80B1	NF–3	Upper cassette	7.45

(continued on next page)

Table 6–5 (Cont.) Tray Errors

Display		Query	Description	
Operational	Diagnostic	Byte–bit	Brief	FULL
Wrong Size Paper In LCIT Paper Tray	11xx.80B5	NF–5	LCIT paper size error event	7.46
???	11xx.80C5 11xx.80C7 11xx.80C9	–	Paper in the upper or lower cassettes or in the LCIT is too short.	7.30

6.8 Miscellaneous Messages

Table 6–6 alphabetically lists miscellaneous messages that appear on the display in the operational or diagnostic modes. The same information is listed numerically by diagnostic display on Table 6–2.

Miscellaneous errors should automatically clear when the operator or Services engineer corrects the problem. If the message fails to clear, turn to the start FIPS in Chapter 7.

Table 6–6 Miscellaneous Errors

Display		Query	Description	
Operational	Diagnostic	Byte–bit	Brief	Full
Cleaning Unit Full See Operator Guide	11xx.00E5	NE–5	Cleaning unit is full	7.43
Perform user Maintenance	11xx.00E4	NE–4	The display is reset by new OPC drum.	7.42
Add Toner And Clean Components	11xx.00E6	NE–6	Toner level is low, customer cleaning is necessary	7.8
Charge Wire Cleaning In Progress	11xx.00E3	N1–3	Charge wire cleaning cycle.	7.14
?54–Retrying Bootstrap	—	—	Failure to initiate system boot.	7.50
?55–Volunteer Provided Unknown File	—	—	A host responded with incorrect boot file.	7.50
?4–Fatal software error Reboot or cycle power	—	—	Controller error occurred during boot process.	7.48

7

Power Panel and Display Message FIPs

This chapter contains the power and LCD panel message fault isolation procedures (FIPs). For paper jam and print quality FIPs see Chapter 8 and Chapter 9.

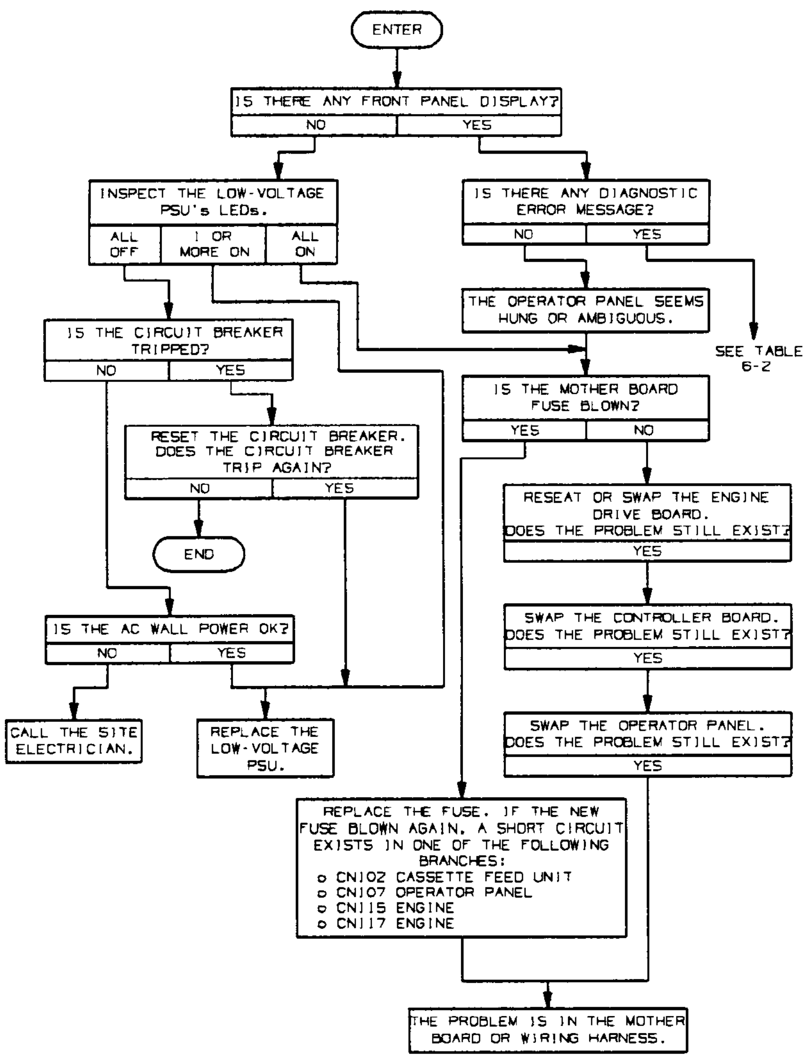
The following fault isolation procedures (FIPs) are a collection of yes/no flow charts and tables. The FIPs provide a way to fix or ensure the correct operation of the hardware. Section 6.3 is the start FIP. Always start troubleshooting at start FIP. It will isolate the problem and direct you to one of the Table 7–1 FIPs.

Table 7–1 FIP Directory

Section	Explains
6.3	Start FIP
6.4.1	Reading the Error Message
7.1	**Power/Panel FIP**
	Operator Panel FIPs
8	Paper Jam FIPs
9	Print Quality FIPs

7.1 Power/Panel FIP

Before entering the following procedure make sure you have completed the instructions called for the Section 6.3, Start FIP.



7.2 Controller, Memory, or Interconnection Errors

As explained in Section 6.4.1, all displayed codes within the range of 00xx.???? to 0Exx.???? are caused by errors that occur during the electronic testing of the controller, memory boards, or by testing of network interconnection equipment.

1. If a diagnostic code begins with **0F**, refer to diagnostic error codes that begin with 11. For example, 0F09.0070 is the same as 1109.0070.
2. If diagnostic error codes begin with numbers from **00** to **0A** or **0C** to **0E**, look at the XX portion of the code.
   - If XX = 01, replace the controller board.
   - If XX = 02, replace the optional memory board.
   - If XX = 03, replace the controller board or the optional memory board.
3. If diagnostic error codes begin with **0B**, check the following for bad connections or faulty components:

   – Ethernet connections
   – Network configuration
   – DESTA
   – Controller board
   – Harness from the mother board to the transceiver connector

   Typical errors for this are:

   – 0101.1002—The Ethernet address ROM is not installed properly or is missing from the controller board.
   – 0B01.7004—The ThinWire is not connected at the DESTA BNC connector.
   – 0B01.7008—ThinWire connections are not terminated properly.
   – 0B01.700A—The Ethernet fuse is blown or the +12Vdc or +24Vdc supply is bad. See instructions in Section 7.1.
   – 0B01.7010—The Ethernet is not connected or not loopback connector. at the D-sub transceiver connector.

7.3 Operator panel Unit Error

Explanation: The Operator panel fails during a power-up self-test or fails the controller/Operator panel interface power-up self-test.

Action:

1. Inspect the engine drive board switchpack. For normal operation, all eight switches must be down or off.
2. Swap the Operator panel unit.
3. Swap the controller board.
4. Swap the mother board (not likely).

7.4 Print Engine CPU Error

Explanation: The print engine drive board self-test fails during power up or while executing the INITIALIZE command. The print engine drive board detects an error during memory tests or I/O loopback tests.

Action:

1. Recycle power from the main switch.
2. If the problem still exists, replace the print engine drive board.

7.5 Development Motor Error

Explanation: The development motor is not up to speed 0.5 second after being turned on by $\overline{DMTR}$. $\overline{DMLOK}$ remains high for more than 0.5 second after the motor is on. This signal should go low when the motor is up to speed. After the motor runs for 2 seconds, the motor error is not detected.

Signal diagram reference: Figure 1–6

Action:

1. Check connector CN108 on the mother board. (See Figure 1–6)
2. Check for any binding drive mechanism.
3. Swap the development motor unit.
4. Swap the print engine drive board (not likely).
5. Swap the mother board (not likely).

7.6 Main Motor Error

Explanation: The main motor up-to-speed signal ($\overline{OMLOK}$) fails to go low within 0.5 seconds after the $\overline{OMTR}$ turns on the main motor. This indicates that the motor fails to turn,

Signal diagram reference: Figure 1–6

Action:

1. Check connector CN109 on the mother board.
2. Check for any binding drive mechanism.
3. Swap the main motor unit.
4. Swap the print engine drive board (not likely).
5. Swap the mother board (not likely).

7.7 Low-Voltage Power Supply Error

Explanation: One of the DC outputs (12V, -12V, or 24V), except 5V, is abnormally low for more than 400 milliseconds.

Action:

Signal diagram reference: Figures 1–8 and 1–6

1. Check the cable harness at connector CN111 from the mother board to the power supply unit.
2. Swap the low-voltage power supply.
3. Swap the print engine drive board (not likely).
4. Swap the mother board (not likely).

7.8 Add Toner Display

Explanation: When a toner low event is detected, the engine drive board sets the NE–6 bit and displays either the FTM error message 11xx.00E6 or the online **Add Toner and Clean Components** message.

To initiate a toner low event the engine drive board must receive five consecutive pulses of the $TNEND$ signal. To clear a toner low event, the toner cover set ($TNCST$) signal must toggles from high to low to high. This indicates that the development draw has opened and closed.

Signal diagram reference: Figure 1–6

Action: Use the following test and procedure to fix a toner low event:

1. The following three failures are ranked according to the likelihood of occurrence. Inspect, test, or swap the indicated components.
   - Failure to clear the toner low message is caused by a malfunctioning cover set sensor circuit.
   - Failure to detect toner low is caused by a faulty toner out sensor circuit or developer unit.
   - False toner low events are highly unlikely but might be caused by a bad developer unit or by a electrically noisy toner empty sensor.
2. Swap the engine drive board.
3. Swap the mother board.

To test the sensors, use a VOM to measure the signal while you actuate the sensor linkage to toggle the sensor signal:

Sensor Signal	Pin #	If signal fails to toggle...
Toner cover set $TNCST$	CN107–B3	Suspect the cover set sensor, the tab on the toner cover, or the engine drive board
Toner end $TNEND$	CN107–B6	The toner end sensor is bad or disconnected.

7.9 Cover Interlock Error

Explanation: The interlock circuit consists of a motor drive current interrupt circuit and of low power sensor circuits.

The 24-volt ($+24VINTA$) motor drive current goes through three serial devices. When the LCOT and engine side door interlock switches are closed by metal tangs mounted on the doors. When the front door closes, the 24V jumper closes the gap in the 24V motor current circuit.

One pole of the two interlock switches opens and closes the 24V motor current. The second pole pulls the $\overline{CCLSE3}$ and $\overline{CCLSE2}$ to ground.

The front cover closed photointerruptor sensor is actuated by a tang on the front cover.

Signal diagram reference: Figures 1–6, 1–8 and 1–10

Action:

1. Check for a bowed front cover; push in the front cover. If the problem goes away, replace the bowed cover.
2. Close all three doors and check the following on the mother board:
   - If CN113–1 is not at 24V, check the power supply cable harness to connector CN111 on the mother board. Swap the low-voltage power supply.
   - If CN113–2 is not at 24V, open the front cover and remove inner-left cover.
     - If the top pin of the side cover interlock switch is not at 24V while the side cover is closed, replace the side cover interlock switch.
     - If the 24V jumper interlock or its receptacle are damaged, replace them.
   - If CN118–2 is not at 24V while all three covers are closed, replace the LCOT.
   - Swap the print engine drive board (not likely).
   - Swap the mother board (not likely).

7.10 LCOT Eject Motor Error

Explanation: The LCOT eject motor up-to-speed signal ($\overline{EMLOK}$) fails to go low.

Signal diagram reference: Figure 1–10

Action:

1. Inspect the 4-pin CN123 connector on the mother board.
2. Swap the LCOT unit.
3. Swap the engine drive board.

7.11 Laser Diode Power Error

Explanation: During power up or printing, the print engine drive board detects low or high laser power from laser diode unit.

Signal diagram reference: Figure 1–9

Action:

1. Check the cable harness from CN117 to the optical unit.
2. Swap the optical unit.
3. Swap the print engine drive board.
4. Swap the mother board (not likely).

7.12 Polygon Motor Error

Explanation: The polygon motor is not up to speed 0.5 second after power up. $PMLOK$ remains high for more than 0.5 second after the motor is on. This signal should go low when the motor is up to speed. After the motor runs for 15 seconds, the motor error is not detected.

Signal diagram reference: Figure 1–9

Action:

1. Check the cable harness from CN117 to the optical unit.
2. Swap the optical unit.
3. Swap the print engine drive board.
4. Swap the mother board (not likely).

7.13 Detector Pulse Missing

Explanation: The print engine drive board fails to receive the *PDDEPT*, line sync signal, after 30 milliseconds of printing. The pulse is checked during the printing cycle, at power up, and during a cover close reset cycle.

Signal diagram reference: Figure 1–9

Action:

1. Check the optical cable connection from CN120 to the optical unit.
2. Swap the optical unit.
3. Swap the print engine drive board.
4. Swap the mother board (not likely).

7.14 Charge Wire Cleaning Motor Errors

Explanation: The engine drive board signals, *CKMTRF* and *CKMTRR* drive the charge wire cleaning motor. The engine drive board monitors the turn-on time and cleaning motor stall current to determine correct operation or an error condition.

The charge wire cleaning motor gear meshes with the gear on the screw shaft which moves the cleaning pad arm. The motor is mounted on the engine bulkhead, the cleaning arm and screw shaft are part of the main charging unit.

A full charge wire cleaning cycle occurs approximately every 5000 sheets. A partial cleaning cycle occurs at power up or if the interlock circuit detects the opening and closing of the front or side doors.

During a full or partial the cycle, the arm and pad move rearwards then frontwards to the home position. When the arm reaches the rear stop, the engine board senses the stall current and reverses the motor. When the pad reaches the front home position, the engine drive board detects the stall, shuts off the cleaning motor, and terminates the charge wire cleaning cycle.

Cleaning Motor Errors:

The following error messages concern the charge wire cleaning motor:

- The **11xx.00E3 or Cleaning In Progress** messages mean that a full cleaning cycle is requested or underway. When the engine drive board CG COUNTER times out, the **N0E–3** bit is set. The controller board software stops feeding paper, clears the paper path, and initiates the full cleaning cycle. During the cleaning cycle, the **N0–1** bit is set. When the full cycle ends, printing is resumed, no pages are lost. If an error occurs during the full cleaning cycle, one of the following fatal or nonfatal error messages is displayed. A full cleaning cycle occurs only when the printer is booted and READY is displayed, it will not occur offline.

7.14 Charge Wire Cleaning Motor Errors

- A **Re-insert Main Charger or 11xx.0134** message appears when one cleaning motor failure has occurred and is nonfatal. The engine drive board sets the **N0E–6** bit. The condition is cleared when the front or upper and lower side doors are opened and closed. If the error a second time, the following fatal message is displayed.
- A **HARDWARE ERROR 26 or 11xx.0026** message appears after the above message and is fatal. The engine drive board sets the **N02–6** bit. To clear the condition power the printer off then on or initialize the engine with the **2, 2, 6 FTM keys**

Signal diagram reference: Figure 1–6

Action: You can hear the whirring of the cleaning motor after power up or after the opening and closing of a front or side door.

1. Open the front door, remove and inspect the main charger unit.
    - If the unit is damaged replace it.
    - The cleaning pad arms should be at the home (front) position. Manually rotate the screw shaft gear to move the arms the full length of the track. The gear and arms must move easily and smoothly.
    - Swap the main charger unit making sure it is fully installed.
2. If the charging unit is ok, inspect the 2-pin plug that connects the cleaning motor to the wire harness.
3. Inspect the connection of CN109 to the mother board.
4. Swap the following:
    - The engine drive board
    - The cleaning motor
    - The mother board

7.15 Excessive Fuser Current

Explanation: If circuitry on the low-voltage power supply board detects that the heater current is on for longer than 20 seconds, it pulls the $\overline{HTERR}$ signal low.

The engine drive board responds to the low signal by pulling the $\overline{HEAT}$ signal high, setting bit 3 of query byte NO3 to one (1), and interrupting the controller board.

Signal diagram reference: Figure 1–8

Action: Inspect the condition of the following components. Look for short circuit, damaged insulation, burn marks, etc. Swap each component, in turn, to find the faulty unit.

1. Low-voltage power supply unit
2. Print engine drive board
3. Fusing unit
4. Mother board (not likely)

7.16 Fuser Temperature Too Low

Explanation: The analog $THERM$ thermistor signal indicates that the surface of the fusing roller did not reach the operating temperature of 185°C (365°F) after $\overline{HEAT}$ was active for 150 seconds.

Signal diagram reference: Figure 1–8

Action:

1. Power off the printer.
2. Remove the back cover.
3. Measure the resistance of the serial thermal fuse. If the fuse is open, (High resistance) refer to the corrective actions in Section 7.17.
4. Make sure the front cover is closed and do the following:
   - Use the ohmmeter to check the continuity through the two outer pins (pins 1, 2) and through the two inner pins (pins 3, 4) of the fusing interlock switch. Swap the fusing unit interlock switch.
   - Inspect the condition of the fusing heater lead in wires. They travel from CN115, the fuser connector, in a cable harness, to CN1 of the low voltage power supply unit.
5. Swap the fusing unit.
6. Swap the low-voltage power supply.
7. Swap the print engine drive board (not likely).
8. Swap the mother board (not likely).

7.17 Fuser Temperature Too High

Explanation: The fusing temperature continues to rise or exceeds 210° C (410° F) after the fusing current is turned off. The engine drive board senses the temperature via the thermistor and $THERM$ signal, and turns on fusing current by pulling low $\overline{HEAT}$. Normal temperature range is 185°C ± 10°C (365°F ±50).

NOTE: *The serial thermal fuse in the fusing AC current circuit opens permanently, if the fusing temperature reaches approximately 320°C (608°F).*

Signal diagram reference: Figure 1–8

Action:

1. Inspect the entire surface condition of the fusing unit rollers.

   If the surface is undamaged by heat, and the thermal fuse is intact, replace the low-voltage power supply unit.

   If you see any heat damage, replace the low-voltage power supply unit and the fusing unit.

2. Swap the print engine drive board (not likely).

3. Swap the mother board (not likely).

7.18 Fuser Thermistor Broken

Explanation: The voltage level of $THERM$ remains too low (close to 0V) after the $\overline{HEAT}$ was active for more than 2 seconds.

Signal diagram reference: Figure 1–8

Action:

1. Allow the fusing unit to cool to room temperature.
2. Remove the fusing unit and measure the thermistor circuit resistance across the two white wires of the fusing connector.

   At room temperature the thermistor resistance should measure approximately 90–110 Ω. The resistance decreases as the thermistor heats up and rises as the it cools.
3. Measure continuity from the fusing connector block to to CN115–B13 and of CN115–B12 of the mother board.
4. Swap the fusing interlock switch assembly.
5. Swap the print engine drive board (not likely).
6. Swap the mother board (not likely).

7.19 LCIT/Duplexer CPU Error

Explanation: The print engine drive board received a self-test failure message from the duplexer/LCIT drive board during an initialization ROM checksum and the RAM read/write tests.

Action:

Swap the duplexer/LCIT drive board.

7.20 LCIT Tray Motor Error

Explanation: This message occurs when duplexer/LCIT control board fails to see an upper limit or lower limit signal within 12 seconds of raising or lowering the elevator. When the LCIT cover closes it closes both poles (switches) of the interlock switch. One pole signals the duplexer/LCIT control board by shorting $\overline{LCOPN}$ to ground. The other pole closes to complete the drive current circuit to the LCIT motor.

The following table shows the state of the signals, direction of travel, and events that cause the motion:

ELVMU CN407–1	ELVMD CN407–2	Tray Direction	Comment
0V	0V	No motion	Normal condition.
24V	24V	Fails to move	Replace the Duplexer/LCIT control board.
24V	0V	Up	After loading and closing the LCIT door, the elevator moves up until paper height or upper limit is asserted.
0V	24V	Down	When a LCIT paper empty event occurs, the duplexer/LCIT control board lowers the elevator.

All voltage measurements are made with respect to ground.
Low = 0 to 6V
High = 24Vdc

Signal diagram reference: Figure 1–12

Action:

1. Inspect the LCIT to duplexer/LCIT control board cable harness.
2. Swap the LCIT.
3. Swap the duplexer/LCIT control board.

7.21 LCIT/Duplexer Communication Error

Explanation: The duplexer/LCIT drive board fails to reply to commands from the print engine drive board.

Signal diagram reference: Figure 1–12

Action:

1. Check the cable connecting CN119 on the mother board to CN401 on the duplexer/LCIT drive board.
2. Inspect the following:
   - The 3-pin and wire connector and cable harness that feeds power from the low-voltage power supply unit to the duplexer/LCIT drive board. The following voltages are measurable on CN401:
     - CN401-1 is ground
     - CN401-2 in +5Vdc
     - CN401-3 is +24Vdc
   - If DC power is not present at the power supply, replace the low-voltage power supply.
3. Swap the duplexer/LCIT drive board.
4. Swap the print engine drive board (not likely).
5. Swap the mother board (not likely).

7.22 LCIT Feed Unit Motor Error

Explanation: The LCIT feed unit motor drives the three LCIT feed rollers and the cabinet feed rollers. In the forward direction, the motor feeds paper from the LCIT or duplex units. In the reverse direction, the motor ejects paper from the feed rollers into the LCIT, as the elevator is descending.

If the $\overline{LMLOK}$ signal fails to go low after the $\overline{LMDIR}$ or $\overline{LMTTR}$ signals turn on the motor, the LCIT/duplex controller will lower the LCIT elevator and the engine drive board will set N4–3 to one.

Signal diagram reference: Figure 1–12

Action:

1. Inspect the connection of CN404 to the duplex/LCIT control board.
2. Swap the duplex/LCIT control board.
3. Remove, inspect, or swap the LCIT feed unit.

7.23 Print Engine Front Cover Is Open

Explanation: $CCLSE1$ is high (5V) at the engine drive board.

Signal diagram reference: Figure 1–6

Action:

1. Inspect the condition of the front door and the metal tangs that actuate the front cover closed sensor.
2. Make sure the front door and development draw are completely closed. The left and right magnetic latches must catch.
3. Hold the VOM lead onto pin A7 of CN115 on the mother board.
4. When you open and close the front door, A7 should toggle from high to low.
   - If A7 fails to toggle, replace the total counter unit, which includes the bad optical sensor.
   - If A7 toggles correctly, swap the print engine drive board.
5. Swap the mother board (not likely).

7.24 LCOT Cover Is Open

Explanation: $\overline{CCLSE3}$ is high (5V) at the engine drive board.

Signal diagram reference: Figure 1–11

Action:

1. Make sure the LCOT door is fully closed and undamaged.
2. Hold the VOM lead onto pin-5 of CN118 on the mother board, (signal $\overline{CCLSE3}$).
3. When the LCOT door is opened and closed, $\overline{CCLSE3}$ should toggle high to low. (5–0 Vdc)
   - If $\overline{CCLSE3}$ fails to toggle, the interlock switch is faulty. Replace the LCOT.
   - If $\overline{CCLSE3}$ toggles correctly, replace the print engine drive board.
4. Swap the mother board (not likely).

7.25 Print Engine Side Cover Is Open

Explanation:

Signal diagram reference: Figure 1–6 $CCLSE2$ is high (5V) at the engine drive board.

Action:

1. Make sure the engine side door is fully closed and undamaged.
2. Hold the VOM lead onto pin-4 of CN113 on the mother board, (signal $\overline{CCLSE2}$).
3. When the side door is opened and closed, $\overline{CCLSE3}$ should toggle high to low. (5–0 Vdc)
   - If $\overline{CCLSE2}$ fails to toggle, Replace the engine side cover interlock switch.
   - If $\overline{CCLSE2}$ toggles correctly, replace the print engine drive board.
4. Swap the mother board (not likely).

7.26 LCIT Cover Is Open

Explanation: *LCOPN* is high (5V) at the duplexer/LCIT drive board.

Signal diagram reference: Figure 1–12

Action:

1. Inspect both LCIT cover interlock tabs, hinges and covers. Fix or replace any damage.
2. Inspect the condition of the cable harness from the duplexer/LCIT drive board to the LCIT.
3. Swap the LCIT.
4. Swap the duplexer/LCIT drive board.

7.27 Duplexer Transport Guide Display

Explanation: *DXOPN* is high (5V) at pin-4 of CN408 of the duplexer /LCIT drive board.

Signal diagram reference: Figure 1–12

Action:

1. Inspect the condition of the duplex transport and the sensor.
2. Make sure CN408 is correctly plugged in.
3. Close and latch the duplex transport.
4. Measure the voltage at pin-7 of CN408 on the duplexer/LCIT control board, the *DXOPN* signal.
5. When the duplex transport is opened and closed, *DXOPN* should toggle from high to low. If *DXOPN* fails to toggle, the sensor is bad. Remove the duplexer and inspect it for damage at the optical interlock sensor. Swap the duplexer unit if necessary.
   - If the signal toggles correctly, replace the duplexer/LCIT board.

7.28 Upper or Lower Cassette Motor Error

Explanation: The engine drive board fails to see the $UPEND$ or $LWEND$ paper height signal within 4 seconds of after turning on the cassette feed motor. The event is initiated when the drive board sees activity a paper size sensor is actuated.

Signal diagram reference: Figure 1–10

Action:

1. Check for damaged paper size tabs on the cassette and replace the cassette if necessary.
2. Swap cassettes, to verify a damaged cassette.
3. Inspect the condition of the cable harness from CN102 of the mother board to the distribution board of the cassette feed unit.
4. If the error occurs without a cassette installed, replace the cassette feed unit.
5. Swap the cassette feed unit.
6. Swap the print engine drive board.
7. Swap the mother board (not likely).

7.29 LCOT Lower or Upper Offset Motor Error

Explanation: The lower or upper offset motor has failed. This is not a fatal error.

Signal diagram reference: Figure 1–11

Action:

1. Check connector CN114 at the mother board.
2. Check for any obstruction, such as a binding cam, jammed paper, and so on, at the exit rollers.
3. Swap the LCOT.
4. Swap the engine drive board (not likely).
5. Swap the mother board (not likely).

7.30 Paper Too Short Error

Explanation: The length of the sheet as measured by the paper paper path sensors differs from the length defined by the source paper size sensors. The paper path sensors read the cassette key or the position of the LCIT size dial.

Signal diagram reference: Figures 1–10 or 1–12

Action:

1. Make sure the correct size paper is loaded in the cassette or LCIT.
2. If the source is a cassette, exchange cassettes to verify damaged cassette or incorrect cassette key.
3. If the source is the LCIT, make sure the dial is set correctly.
4. The paper feed unit or the LCIT.
5. A faulty paper path sensor is more likely to produce a jam indication than this type of error.

7.31 Upper/Lower Paper Cassette Missing

Explanation: The paper size key is not seen by the upper/lower cassette paper size optical sensor.

Signal diagram reference: Figure 1–10

Action:

1. Make sure the paper size key is properly installed on the cassette.
2. Make sure the cassette seats properly in the slot.
3. If the same problem exists on both cassettes' slots, check the cable harness from CN102 of the mother board to the cassette feed unit. Swap cassette paper feed unit.
4. If there is clicking noise, the tray is rising and dropping repeatedly because the paper-height sensor is faulty. Replace the cassette paper feed unit.
5. Swap the cassette paper feed unit.
6. Swap the print engine drive board.
7. Swap the mother board (not likely).

7.32 Upper/Lower Paper Cassette Empty

Explanation: The upper/lower cassette paper-height $UPPHT$/$LWPHT$ is low and the paper-end $UPEND$/$LWEND$ is high.

Signal diagram reference: Figure 1–10

Action:

1. Loosen two screws to slide the high-voltage power supply to the right to gain access to the paper feed unit distribution board.
2. Insert a paper cassette with some paper in it and wait until it rises and stops at the operating position:

   Check $UPEND$ (CN562–4) or $LWEND$ (CN563–10) of the paper feed unit distribution board.

   - If the signal is 0V, check the cable harness to CN102 of the mother board. Swap the print engine drive board.
   - If the signal is 5V, the paper-end sensor is faulty. Swap the cassette paper feed unit.
3. If the paper cassette does not rise after being inserted, check for an obstruction caused by the paper pickup roller being stuck at the upper position.

   If the pickup roller moves up and down freely, but the cassette does not rise, the paper-height sensor is faulty. Swap the paper feed unit.
4. Swap the mother board (not likely).

7.33 LCIT Empty or Paper Stack Is Not at Operating Height

Explanation: The LCIT empty sensor signal ($LCEND$) detects an empty LCIT or the stack is fails to rise.

Signal diagram reference: Figure 1–12

Action:

1. Check connector CN405 at the duplexer/LCIT control board.
2. Open the LCIT door, load some paper, and close the LCIT door. Look for the following symptoms:
3. If the tray reaches the top, and lowers right away, the paper-out sensor might be faulty. Swap the LCIT feed unit.
4. If the tray fails to rise:
   - The pickup roller might be stuck at the upper position. See if you can free up the linkage or replace the LCIT paper feed unit.
   - The LCIT tray down switch (on the LCIT control panel) might be sticking. Swap the LCIT.
5. Swap the duplexer/LCIT controller board.

7.34 Side Output Tray Is Not Set Error

Explanation: The side tray open sensor signal ($STCLS$) detects that the side tray is folded. The side tray sensor is part of the fork gate assembly.

Signal diagram reference: Figure 1–6

Action:

1. Open the side tray.
2. Measure $STCLS$ at pin-B4 of CN115.
   - If high, the sensor is faulty. Swap the fork gate unit.
   - If low, replace the print engine drive board.
3. Swap the mother board (not likely).

7.35 Upper/Lower Output Tray Full

Explanation: Two sensors work to detect an overflowing LCOT paper tray. As the stack height rises, the sensors are activated sequentially by the overflow lever linkage. This dual sensor system prevents multiple errors that are caused when a stack is near the overflow height. The following signals are activated by the overflow sensor linkage.

Upper	$\overline{UPOVF1}$	114–B3
	$\overline{UPOVF2}$	114–B20
Lower	$\overline{LWOVF1}$	114–A1
	$\overline{LWOVF2}$	114–A20

Signal diagram reference: Figure 1–11

Action:

1. Make sure the sensor linkage can freely move and does not stick.
2. Connect a VOM to the pins in the above table and raise the sensor linkage up and down. The VOM should toggle from high to low.
   - If the signal fails to toggle replace the LCOT.
   - If the signal toggles, replace the engine drive board.
3. Swap the mother board (not likely).

7.36 Side Output Tray Full

Explanation: The side tray overflow sensor signal, $\overline{SDOVF}$ is low for more than 8 seconds.

Signal diagram reference: Figure 1–6

Action:

1. Empty the side tray and make sure the overflow linkage is down.
2. Inspect the linkage for sticking and free movement.
3. Connect the VOM to pin-B1 of CN115.
4. when you raise and lower the overflow linkage, the $\overline{SDOVF}$ signal should toggle high to low.
   - If the signal fails to toggle, the optical sensor is faulty. Replace the fork gate unit.
   - If the signal toggles, replace the print engine drive board.
5. Swap the mother board (not likely).

7.37 Development Unit Absent

Explanation: *TNCST* is low at the engine drive board.

Signal diagram reference: Figure 1–6

Action:

1. Make sure the development unit cover is seated properly on the development unit.
2. Make sure the development unit is seated properly in the drawer and the drawer is latched properly.
3. Check the alignment between the tab on the developer unit and the sensor on the chassis.
4. Measure the signal *TNCST* at pin-B3 of CN107:
5. When the draw is opened and closed, the signal should toggle from low to high.
   - If the toggle test fails, replace the optical sensor.
   - If the signal toggles, replace the print engine drive board.

7.38 OPC Drum Unit Absent

Explanation: *DRST* is low at the print engine drive board.

Signal diagram reference: Figure 1–6

Action:

1. Make sure the OPC drum is seated properly in the drawer and the drawer is latched properly.
2. Inspect the mounting of the optical drum sensor. Look for bent or misaligned metal. Make sure the 3-pin plug that connects the sensor to the wire harness is correctly plugged in.
3. Measure the signal *DRST* at pin-A2 of CN107.
4. When the development draw is opened and closed, the signal should toggle from low to high.
   - If the signal toggles, replace the print engine drive board.
   - If the toggle test fails, replace the optical drum sensor.

7.39 Cleaning Unit Absent

Explanation: $CLNST$ is low at the print engine drive board.

Signal diagram reference: Figure 1–6

Action:

1. Make sure the cleaning unit is seated properly in the drawer and the drawer is latched properly.
2. Inspect the condition of the cleaning unit and the tab. If the tab is broken, bent, or not aligned with the sensor on the chassis, replace the cleaning unit.
3. Measure the signal $CLNST$ and pin-A7 of CN107.
4. When the development draw is opened and closed, the signal should toggle from low to high.
   - If the toggle test fails, replace the optical cleaning unit sensor.
   - If the signal toggles, replace the print engine drive board.

7.40 Fusing Unit Absent

Explanation: $\overline{FUSST}$ is high at the print engine drive board.

Signal diagram reference: Figure 1–8

Action:

1. Make sure the fusing unit is latched properly.
2. Inspect the blue loopback jumper wire on the fusing unit for continuity.
3. Check the cable harness from CN115 of the mother board to the fuser socket adapter.
4. Inspect the 3-pin connector that connects the harness to the fusing connector bracket.
5. Measure the signal $\overline{FUSST}$ at pin-B14 of CN115.
6. When you remove and install the fusing unit, the signal should toggle from high to low.
   - If the signal toggles, replace the print engine drive board.
   - If the toggle test fails, swap the fusing unit or the fusing connector bracket.

7.41 Failed to Reset Service Maintenance 1 or 2 Counter

Explanation: The electronic maintenance counters produce this error when that reach the count of 320,000 or 2,400,000 prints. This count is different from the count on the mechanical totals counter it is based on main motor rotation time.

Action: When the message is displayed, the service engineer must complete an the steps in Chapter 11.

1. Use the following procedure to reset and clear the message and counter.
   a. Power on the printer and invoke FTM, as shown in Section 4.1
   b. Press keys 2,5,6 to clear a Maintenance Request 1 message.
   c. Press KEYS 2,5,1,6 to clean a Maintenance Request 2 message.
2. If the maintenance message does not clear, swap the following components:
   - The eight pin EEPROM that is socket mounted on the mother board.
   - Print engine drive board
   - Mother board
   - Controller board (not likely)

7.42 Fail to Clear "Perform user Maintenance" Message

Explanation: When message is displayed the customer must replace the charge wires and OPC drum. When the drum starts to turn, the plastic stubs on the new OPC drum actuate the drum change sensor linkage. The sensor signal $\overline{DRCHG}$ goes low, resets the counter, and clears the request. As the drum continues to turn, the sensor linkage shares off the plastic drum stub.

The current value of the maintenance counter is readable through the engine drive board menus, shown in Chapter 12.

Signal diagram reference: Figure 1–6

Action:

1. Install a new OPC drum. (This is a customer task.)
2. In the following step access the drum change sensor linkage through the rear of the print engine. Use a pencil or other suitable tool to actuate the drum change sensor linkage.
3. Measure the signal $\overline{DRCHG}$ at pin–A4 of CN107.
4. Inspect the sensor linkage. Replace the linkage if it is bent or otherwise damaged.
5. When the sensor linkage is actuated, the signal should toggle between high and low.
   - If the toggle test fails, replace the drum change sensor.
   - If the signal toggles, replace the engine drive board.
6. Swap the print engine drive board.

7.43 Cleaning Unit Is Full

Explanation: The cleaning unit circuit is activated when the magnetic flag raising out of the cleaning unit encounters the cleaning unit sensor that is mounted on the main fan unit. The sensor asserts the $\overline{TNOVR}$ signal low that is detected by the print engine drive board.

If the circuit fails, toner overflow and leakage might occur.

Shaking the cleaning unit can trap the toner flag and produce a false cleaning unit full event.

Signal diagram reference: Figure 1–6

Action:

1. Install a new cleaning unit.
2. Inspect the magnet on top of the new cleaning unit. The magnet should stay lower than the top of the cleaning unit.
3. Open the development draw to access the cleaning unit full sensor.
4. Measure the signal $\overline{TNOVR}$ at pin-B7 of CN115.
   - If the signal is low, replace the toner overflow sensor.
   - If the signal is high, replace the print engine drive board.

   Note: *To test the operation of the overflow switch, hold the VOM lead on pin-B7 of CN115. Have an assistant open the development draw and sweep a magnet over the toner overflow sensor. The signal* $\overline{TNOVE}$ *should toggle between high and low.*

7.44 Protocol Timeout Error

Explanation: The controller fails the interface test with the print engine drive board.

Action:

1. Make sure all eight switches of the engine drive board switchpack are set down or off.
2. Swap the print engine drive board.
3. Swap the controller board.
4. Swap the mother board (not likely).

7.45 Upper/Lower Cassette Paper-Size Error

Explanation: While printing a job, the engine detects a paper-size key changed in the current selected cassette. This might occur when a user responds to an **Add paper** message and accidentally switches the size of the cassette.

Signal diagram reference: Figure 1–10

Action: If this problem happened by itself (not by operator error), perform the following:

1. Inspect the cassette for seating or damage.
2. Inspect the cassette size key for damage and correct installation.
3. Swap the cassette paper feed unit for a possible bad optical paper-size sensor.

7.46 LCIT Paper-Size Error

Explanation: While printing a job, the *DIAL* signal changes indicating that the paper-size dial has changed.

This might happen accidentally if the user changes the LCIT size dial in response to as **Add paper** message.

Signal diagram reference: Figure 1–12

Action: If this problem happened by itself (not by operator error), replace the LCIT unit.

7.47 LCIT Dial Wheel Set Incorrectly

Explanation: The LCIT paper size wheel is set between paper sizes. The *DIAL* is low.

Signal diagram reference: Figure 1–12

Action:

- Open the the LCIT door and turn the dial wheel slowly. When you hear a clicking sound, the dial is correctly set.
- Swap the LCIT.
- Swap the duplexer/LCIT control board.

7.48 Fatal Error—Boot Failure

Explanation: The controller detected a fatal error when it tried to boot. This problem should never appear if the controller diagnostics have passed.

Action:

1. Check the network devices and connections.
2. Recycle the power.
3. Swap the controller board.

7.49 LCIT Paper Misplaced

Explanation: The upper limit sensor activated and caused a paper misset event. In response to the event, the duplexer/LCIT drive board lowers the tray to the bottom position and activates the paper misset LED on the LCIT control panel.

Signal diagram reference: Figure 1–12

Action:

1. Make sure the paper is flush against the far wall of the LCIT tray.
2. Open the LCIT, load some paper, and close the cover.
   - If the tray fails to rise do the following:
     a. Inspect the condition of the upper limit sensor linkage. The linkage should freely move up and down.
     b. Measure the signal *PPSER* at pin-B6 of CN406 on the duplexer/LCIT controller board.
     c. When you raise and lower the upper limit sensor bar, the signal should toggle between low and high.
        – If the toggle test fails, replace the LCIT unit.
        – If the signal toggles, replace the duplexer/LCIT control board.
   - If the tray rises and immediately lowers and the Paper Mis-set indicator illuminates, Do the following:
     a. Measure the signal *LPPHT* at pin-4 of CN405 on the duplexer/LCIT control board.
     b. When you raise and lower the prefeed roller sensor linkage the signal should toggle between low and high.
        – If the toggle test fails, replace the LCIT feed unit.
        – If the signal toggles, replace the duplexer/LCIT drive board.

7.50 ?54 or ?55 Retry or Volunteer Error

Explanation: The controller and network hardware are set up correctly, but no host system is available. The printer keeps trying to boot.

Action: Have a privileged user check the following:

- A host system is available on the network.
- The correct version of host software is installed.
- No LAN bridge boot-request-filter is on between the host and the printer.
- The proxy setup is correct in the authorization file, VMS only.
- The VMS logical LPS$SUPPORT points to SYS$SYSDEVICE:[LPS$SERVER].
- The VMS logical LPS$ROOT is defined as SYS$SYSDEVICE:[LPS$SERVER.]. The downline loaded image files point to SYS$SYSDEVICE:[LPS$SERVER.SYS].
- Issue the REPLY/ENABLE command at the operator console terminal and check for load requests from the printer. Check the OPCOM reports for details about the requests (VMS only).
- The network devices are configured correctly. If OPCOM messages recognize the boot request, but the host system aborts from a line communication error/device time out, check the following devices:

–DELNI	–DEMPR
–H4000	–H4005
–DESTA	

- Correct data is in the network data base. Issue the following command from NCP:

  ```
  NCP> SHOW NODE printer_node_name CHARACTERISTICS
  ```

  — Verify the Ethernet hardware address.

  — Verify the load-file name and location.

  — Verify the host circuit.

8
Paper Jam FIPs

This chapters describes the fault isolation procedures (FIPs) to correct malfunctions that cause paper jams in the PrintServer 32. Do not start troubleshooting at this chapter. The start FIP, in Chapter 6, isolates malfunctions and directs you to a section in this chapter. Table 8–1 is a directory of all the PrintServer 32 FIPs, including this chapter.

Table 8–1 FIP Directory

Section	Explains
6.3	Start FIP
7.1	Power/Panel FIP
	Operator Panel FIPs
8	**Paper Jam FIPs**
9	Print Quality FIPs

8.1 Using the Remote Error Logging Facility

For random or intermittent jams, ask the customer to enable the remote error logging facility for an extended time period to capture an adequate number of events.

Instructions for enabling and disabling the error logging facility and the location of the event log file are in the *PrintServer Supporting Host for VMS Management/User's Guide* or *PrintServer Supporting Host for ULTRIX Management/User's Guide*.

8.2 How Jams are Detected

When a jam occurs, the print engine drive board:

- Stops and sets itself to the busy state
- Sends a byte of status information to the controller board

The controller board:

- Determines the location and jam path of each sheet of paper in the paper path
- Displays a message on the LCD display instructing the operator to use the jam clearance labels to clear the jam
- Indicates the location and path of the jam on the graphic panel
- Transmits the jam information to the supporting host event log file

The following terms are used to describe the different types or paper jams:

- **Phantom jams** are jam indications that occur when the printer is idle or powering up, although there is no paper in the indicated paper path. Sticky sensor linkages or damaged electronics are the usual cause of phantom jams.
- **Stalled paper jams** occur normally during printer operations. They are caused by some event such as a door opening or roller malfunction. Printing cannot continue until the stalled paper is removed
- **Shingle jams** occur when sheets of paper overlap like roof shingles. This type of jam is typical of malfunctioning feed or paper path rollers.
- **Dog-eared corners**, edge damage, jams, or very crooked skewed image are typically caused by paper path damage, uneven roller pressure, or contamination of the guide or roller surfaces.
- **Accordion jams** happen when one or several sheets of paper are crammed into a roller nip.

8.2 How Jams are Detected

The operator panel paper path indicators identify the location of paper stalled in the paper path and the feed path. One or more of the indicators light for a single sheet of paper. Multiple indicators light if several sheets are stalled in the printer at a time.

The operator panel indicators do not directly correspond to a paper path sensor. The sensors dynamically track and detect the paper traveling through the printer. The sensors also detect stalled paper if the sheet is directly underneath the sensor. Figure 8–1 shows the location and gives a name to each indicator and sensor.

Normally, an operator must remove all paper from the printer to clear the jam indication and restore the printer to the Ready state.

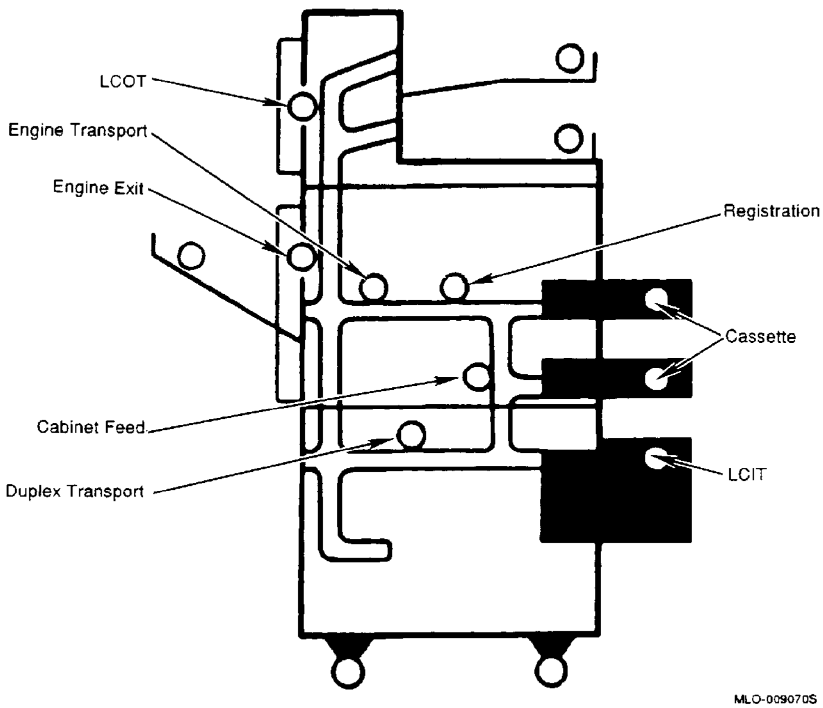
8.3 Jam FIP Directory

Use the graphic panel indicators to find the location of the first jam. If jamming is intermittent, review the remote error log as shown in Section 8.1.

Indicator(s)	Upper or lower cassette with registration
Error log	Paper Jam First Occurred in Upper Feed Path Paper Jam First Occurred in Lower Feed Path
Go to	Section 8.4
Indicator(s)	Cabinet feed with or without registration
Error log	Paper Jam First Occurred in LCIT Feed Path Paper Jam First Occurred in Duplex Feed Path
Go to	Section 8.5
Indicator(s)	Engine transport and registration or both
Error log	Paper Jam First Occurred in Main Transport Area
Go to	Section 8.6
Indicator(s)	Engine exit with LCOT or Duplex transport
Error log	Paper Jam First Occurred in Upper Transport Area Paper Jam First Occurred in Eject Area Paper Jam First Occurred in Lower Transport Area Paper Jam First Occurred in Fuser Area
Go to	Section 8.7
Indicator(s)	Duplex transport
Error log	Paper Jam First Occurred in Duplex Transport Station
Go to	Section 8.8
Indicator(s)	Cabinet feed, engine exit, and duplex transport
Error log	Paper Jam First Occurred in Cabinet
Go to	Sections 8.5, 8.7, or 8.8
Indicator(s)	Any combination of indicators
Error log	Paper Jam First Occurred Due to Cover Open
Go to	Section 7.23, 7.24, 7.25, 7.26
Indicator(s)	Any combination of indicators with fatal error message displayed on the Operator panel.
Error log	Paper Jam First Occurred Due to Engine Fault

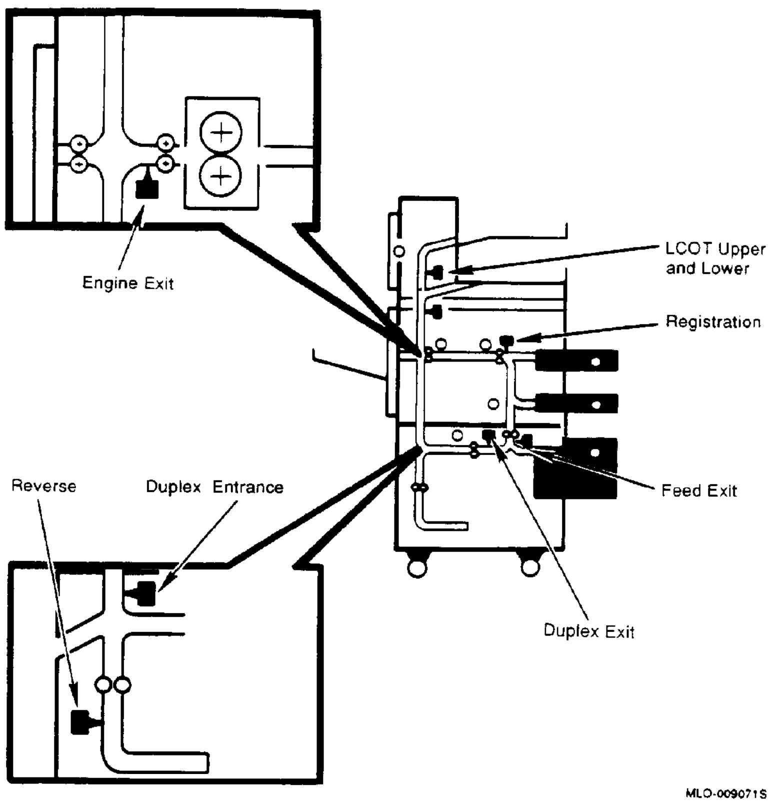
Go to	Table 6–2

Figure 8–1 Paper Path Jam Indicators



8.3 Jam FIP Directory

Figure 8–2 Paper Jam Path Sensors

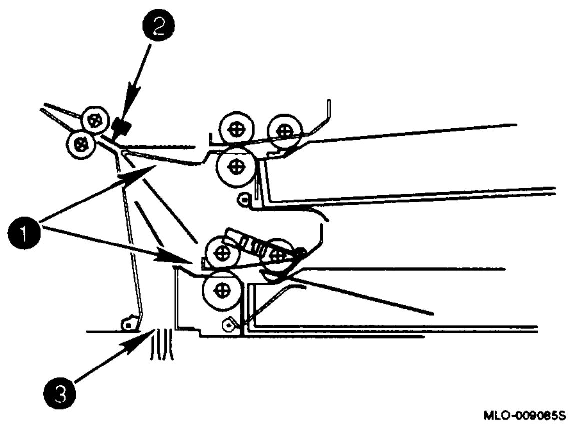


8.4 Cassette Feed Path Registration Jams

This FIP covers registration sensor jams when feeding from the upper or lower cassette. Figure 8–3 shows the section of paper path.

Explanation: The following two conditions cause this type of jam:

- After turning on a feed clutch and roller ❶, the registration sensor ❷ fails to detect the leading edge on time.
- Stalled paper is detected under the registration sensor.
- Suspect the registration sensor if jams occur when feeding from all three sources, the upper, lower cassette and cabinet(LCIT) ❸.



Notes: To test the paper path, use simplex FTM mode test patterns, as shown in Section 4.4.

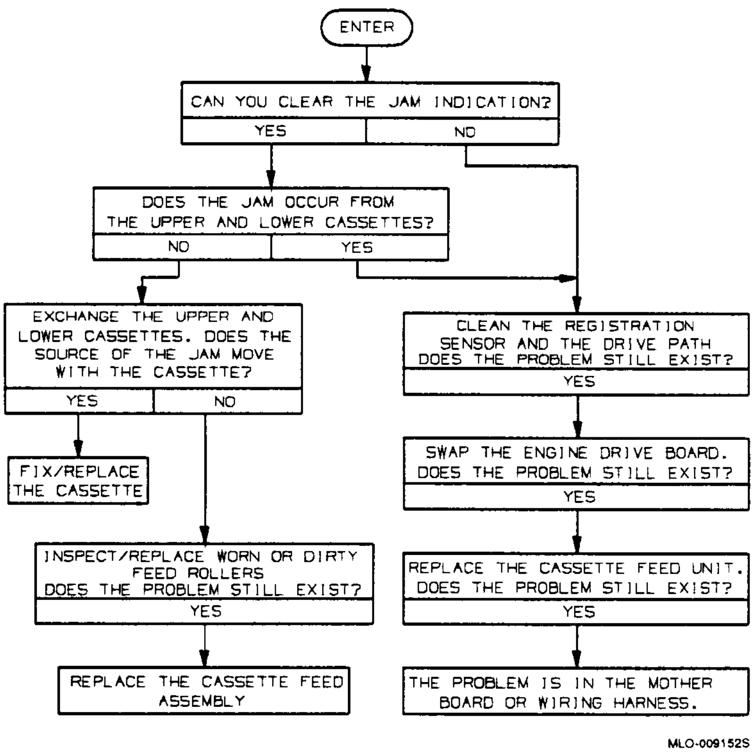
If jamming is intermittent, review the remote error log as shown in Section 8.1.

If jams occur only when feeding from LCIT, goto Section 8.5.

Follow the steps outlined in Figure 8–4 to test and fix cassette feed path jams.

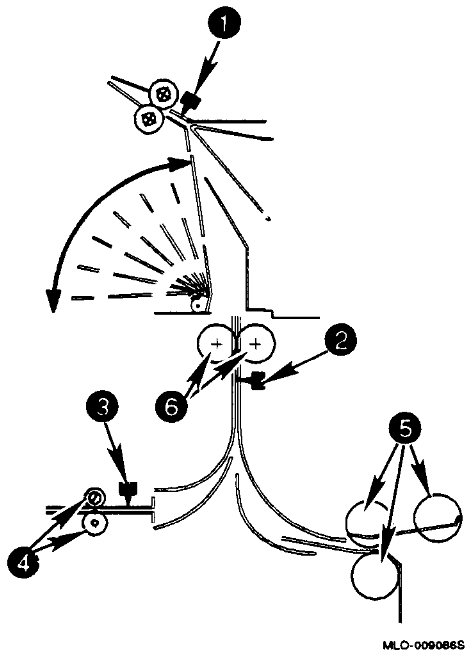
8.4 Cassette Feed Path Registration Jams

Figure 8–4 Registration and Cassette Feed Path Jam



8.5 Cabinet Feed Path Registration Jam

This FIP covers jams that occur in the paper path section shown below:



Explanation: The following conditions cause this type of jam:

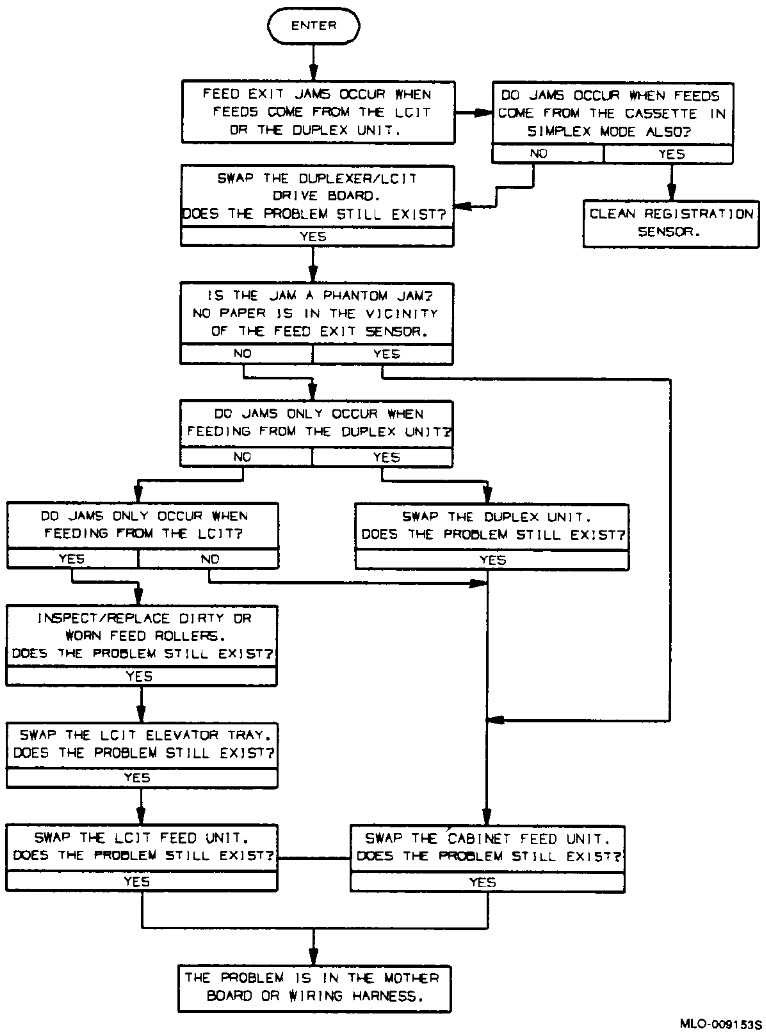
- The registration ❶, cabinet feed ❷ or duplex exit sensors ❸ fail to detect paper on time.
- The cabinet feed or duplex exit sensors find the wrong size paper.
- Stalled paper is detected under the cabinet feed sensor.
- The duplex exit ❹, LCIT feed ❺, or cabinet feed rollers ❻ malfunction and fail to send the paper to the cabinet feed or registration sensors on time.

Notes: If the error occurs during duplex printing, see Sections 8.7 and 8.8.

The cabinet feed motor, in the LCIT feed unit, turns the cabinet and LCIT feed rollers.

The duplex feed motor turns the duplex exit rollers.

8.5 Cabinet Feed Path Registration Jam



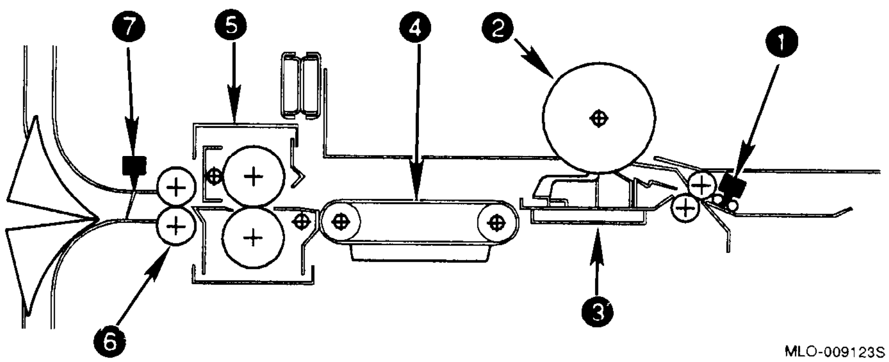
8.6 Drum and Transport Area Jam

This FIP covers jams that occur in the following area (Figure 8–5).

1. Registration sensor
2. Print drum
3. Transfer charger
4. Transport
5. Fusing unit
6. Fusing exit rollers

Explanation:

- After the registration rollers were turned on, the engine exit sensor failed to detect the paper on time.
- The registration sensor detected paper stalled paper.

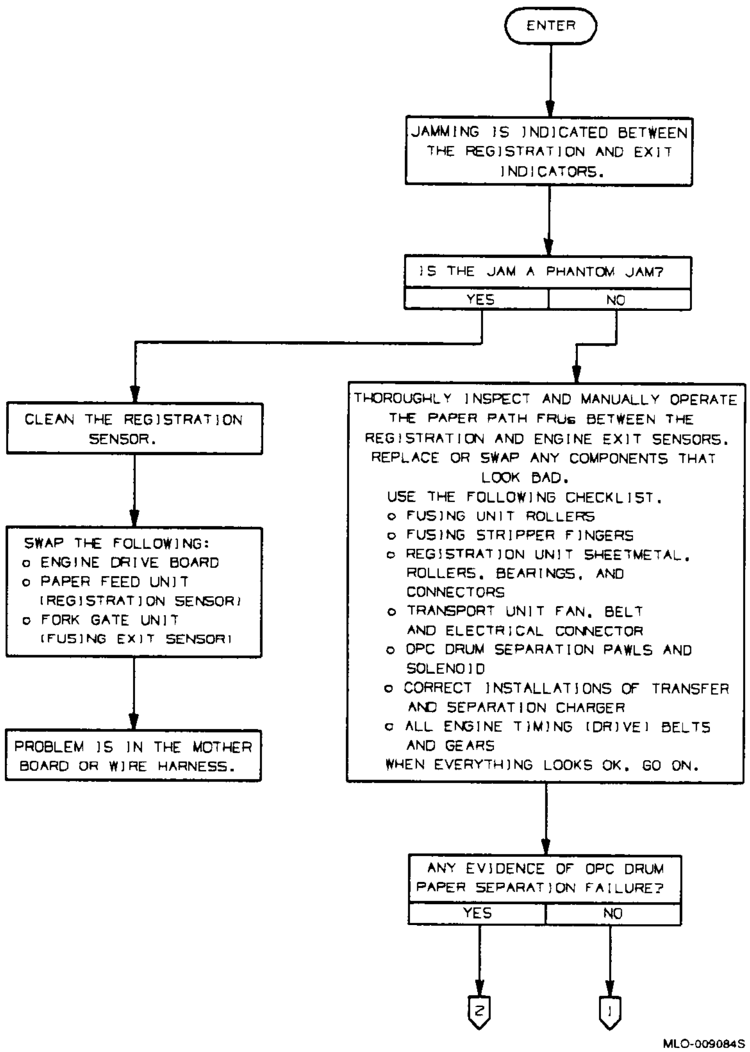


Notes: The registration sensor is not accessible for VOM testing.

The engine exit sensor can be VOM tested by measuring the $\overline{FUPOT}$ signal at pin-A11 of CN115. When the sensor linkage is pressed up and down, the signal will toggle between high and low. If the toggle test fails, inspect the fork gate, sensor, and mother board connectors, than replace the fork gate unit.

8.6 Drum and Transport Area Jam

Figure 8–6 Drum and Transport Area



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8.6 Drum and Transport Area Jam

Figure 8–6 (Cont.) Drum and Transport Area

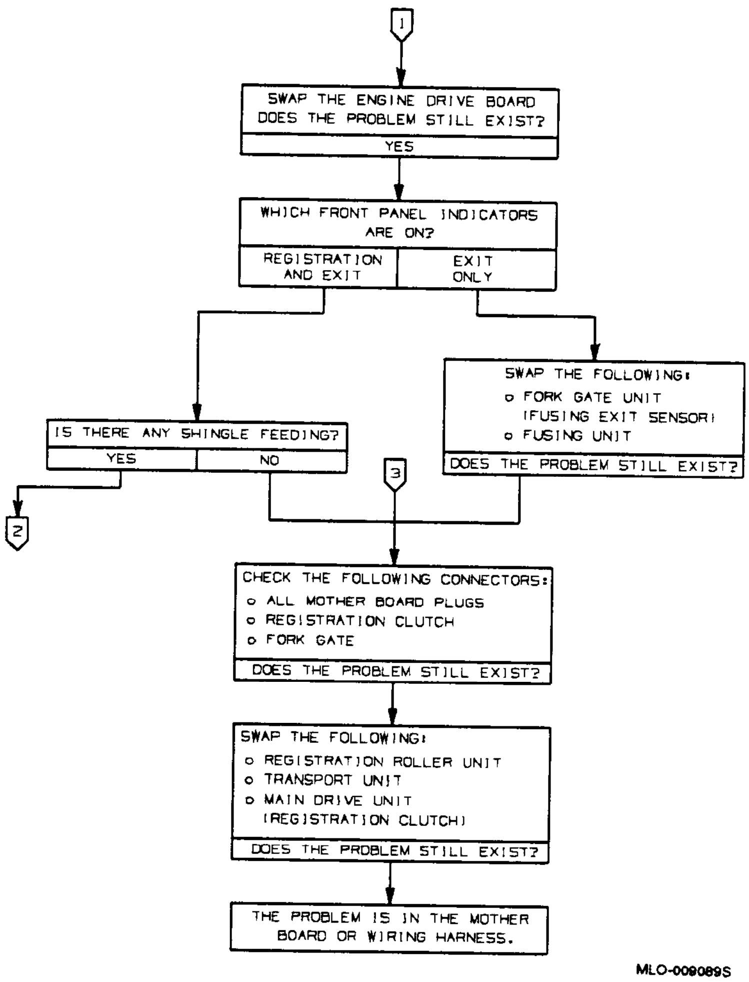

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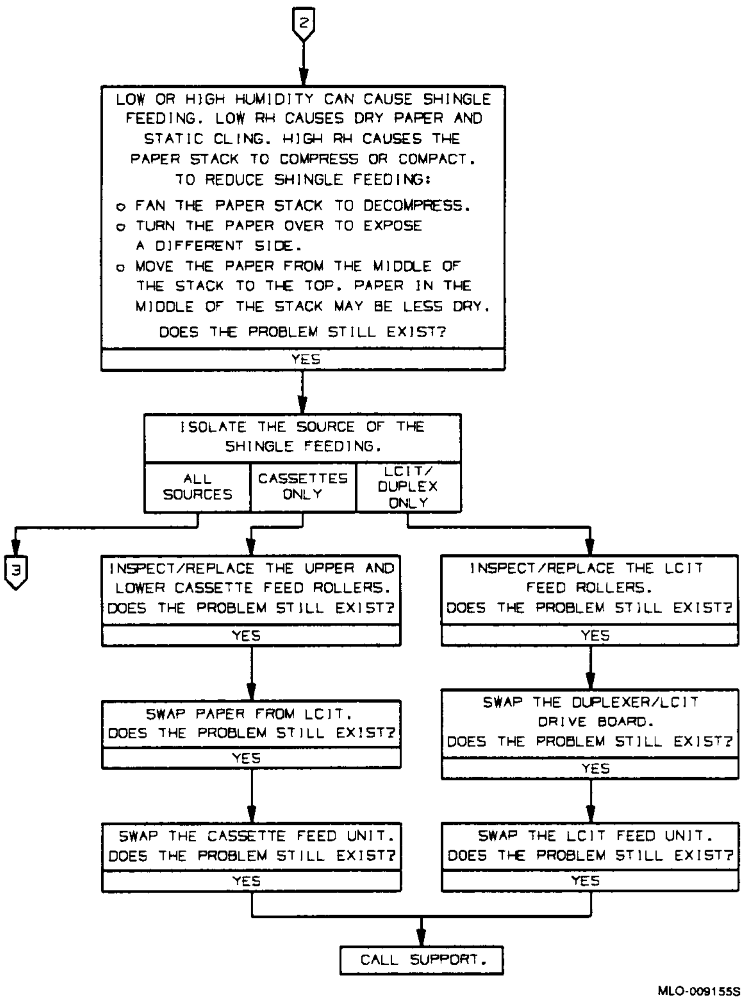
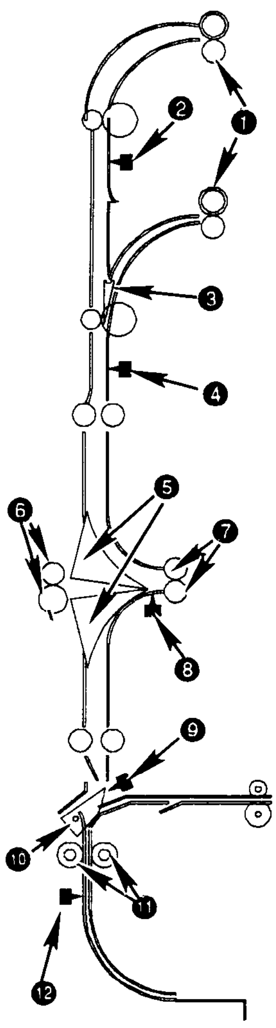
Figure 8–6 (Cont.) Drum and Transport Area



8.7 Engine Exit Jam

This FIP covers jams that occur in the area shown below. Use the FIP flowchart to fix engine exit jams.



❶ Upper and lower LCOT exit rollers

❷ The upper LCOT sensor

❸ LCOT fork gate

❹ The lower LCOT sensor

❺ Upper and lower fork gate

❻ Side tray exit rollers

❼ Duplex entrance rollers

❽ The engine exit sensor

❾ The duplex entrance sensor

❿ Duplex fork gate

⓫ Entrance rollers

⓬ Duplex reverse sensor

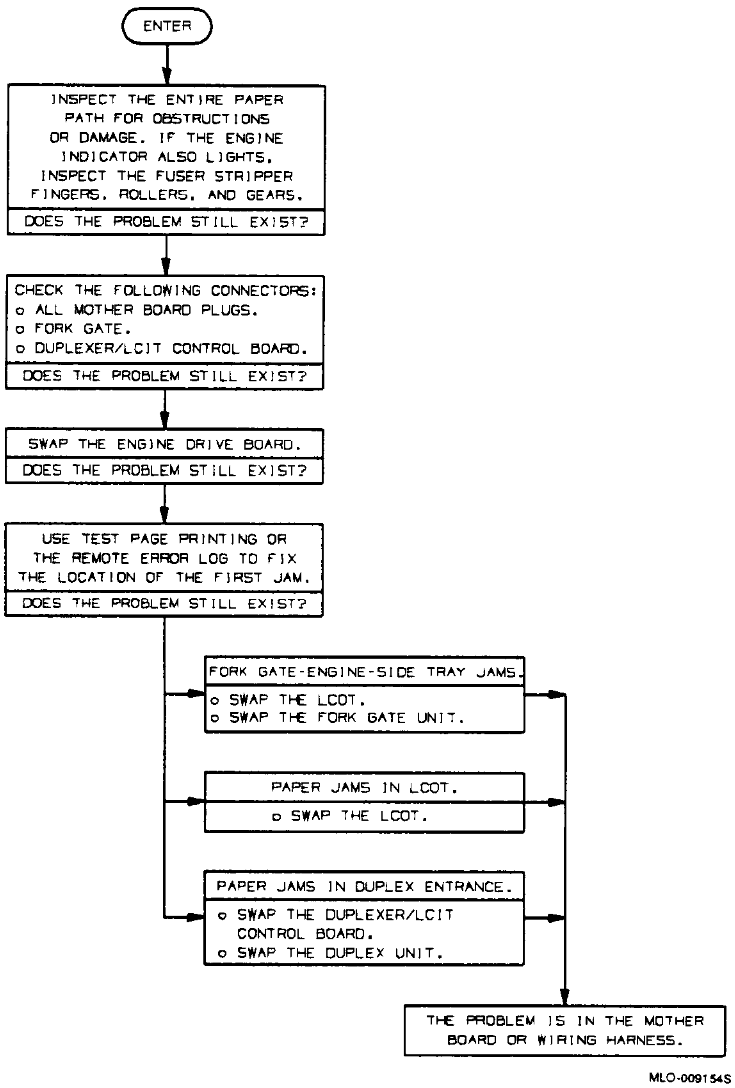
Explanation:

- Paper fails to leave a sensor on time
- A sensor detects paper stalled underneath.
- The upper LCOT sensor fails to detect paper, on time, after it passes the lower LCOT sensor.
- Paper passing the exit sensor fails to arrive, on time, at the duplex entrance or at the lower LCOT sensors.

Notes: The LCOT motor runs all the LCOT and fork gate rollers.

The duplex motor runs the entrance rollers.

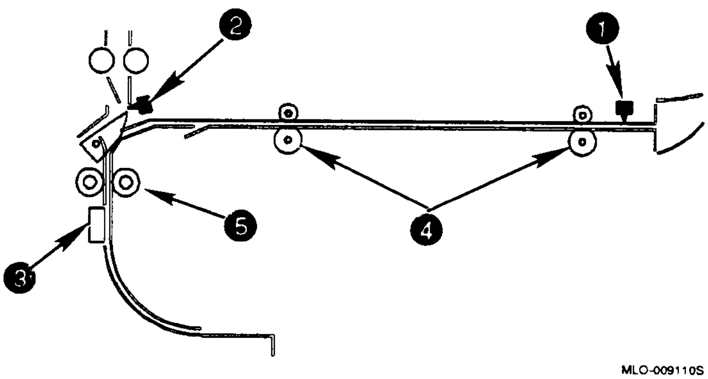
8.7 Engine Exit Jam

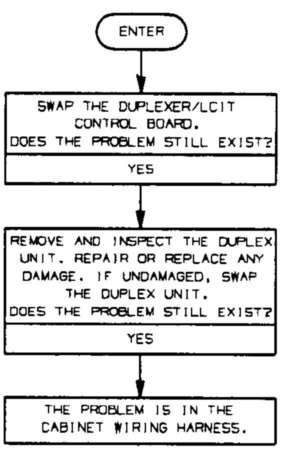


8.8 Duplex Transport Jam

This FIP covers jams that occur in the area shown below. Use the FIP flowchart to fix duplex transport jams

Figure 8–7 Duplex transport jams





Explanation: Jams in this area are caused when the duplex exit sensor fails to:

- The duplex exit sensor ❶ fails to detect paper after it passes the entrance ❷ and reverse ❸ sensors.
- The duplex exit sensor detects stalled paper.

Notes: The duplex motor runs the entrance rollers ❹.

The duplex feed motor runs the ❺ exit rollers.

If the jam occurs the entrance paper or rollers, go to Section 8.7

9

Print Quality FIPs

This chapter provides the fault isolation procedures (FIPs) to correct print quality defects in the PrintServer 32. Always start troubleshooting at the Start FIP. Table 8–1 is a directory of all the PrintServer 32 FIPs, including this chapter.

Table 9–1 FIP Directory

Section	Explains
6.3	Start FIP
6.4.1	Reading the Error Message
7.1	Power/Panel FIP
	Operator Panel FIPs
8	Paper Jam FIPs
9	**Print Quality FIPs**

9.1 Assessing Print Quality

As a preventive measure, follow the total call concepts in Appendix B to maintain customer satisfaction.

To check print quality, perform the following steps:

1. Check that the printer is clean and level.
2. Make sure the trays are half-filled with undamaged, clean, dry, and white xerographic quality paper. Misleading results occur when printing on high rag content, colored, extra light, or heavy paper stock.

9.1 Assessing Print Quality

3. Print several copies of test **Pattern B**, as shown in Section 4.4.
   - **To print the 0240 test page**, issue the following command, see Figure 9–2: The file name of the 0240 test page may be different. Check the LPS$SUPPORT directory for the file name or contact the system manager.

     ```
     $ PRINT/QUE=quename/PARA=DATA=post -
       SYS$SYSDEVICE:[LPS$SERVER]LPS_32_0240.;
     ```

4. Evaluate the quality of the test print image, particularly the four Areas marked on figures 9–1 or 9–2. More than one print quality symptom may exist for each problem. Two or three FIPS may apply. Compare any blemishes to the description in Table 9–2. The "refer to" columns of Table 9–2 point to a measuring figure and to the FIP section.
5. If the customer is not satisfied with the performance of the printer after you have examined the test pattern and corrected the problem, print five simplex copies and five duplex copies of test pattern 0240. Mail them with sample customer prints to:

   Digital Equipment Corporation
   CSCMA SHR3
   334 South Street
   Shrewsbury MA 01545–4112

   Dial: 1–800–354–9000
   Press: 1, for hardware support
   Ask for: the PrintServer team

Table 9–2 Print Quality FIP Defect Directory

Print Quality FIPs	Section...
Black Line	9.23
Black Images	9.3
Blank or Very Light Images	9.2
Fusing Failure	9.6
Blurred, or Smudged Image	9.7
Character-edge or Black-edge Fade	9.19
Dirty Edges	9.24

(continued on next page)

Table 9–2 (Cont.) Print Quality FIP Defect Directory

Print Quality FIPs	Section...
Background Density	9.14
Dirty Second Side	9.15
Distorted or Wavy Image	9.5
Legible Character	9.18
Magnification	9.9
Paper Damage	9.8
Black Spots or Clusters	9.22
Repetitive Marks	9.4
Letter Quality Resolution	9.17
Filling	9.16
Skew	9.12
Density Defects	9.13
White Line	9.10
White Lines or Bands (Faded Areas)	9.11

9.1 Assessing Print Quality

Figure 9–1 Pattern B

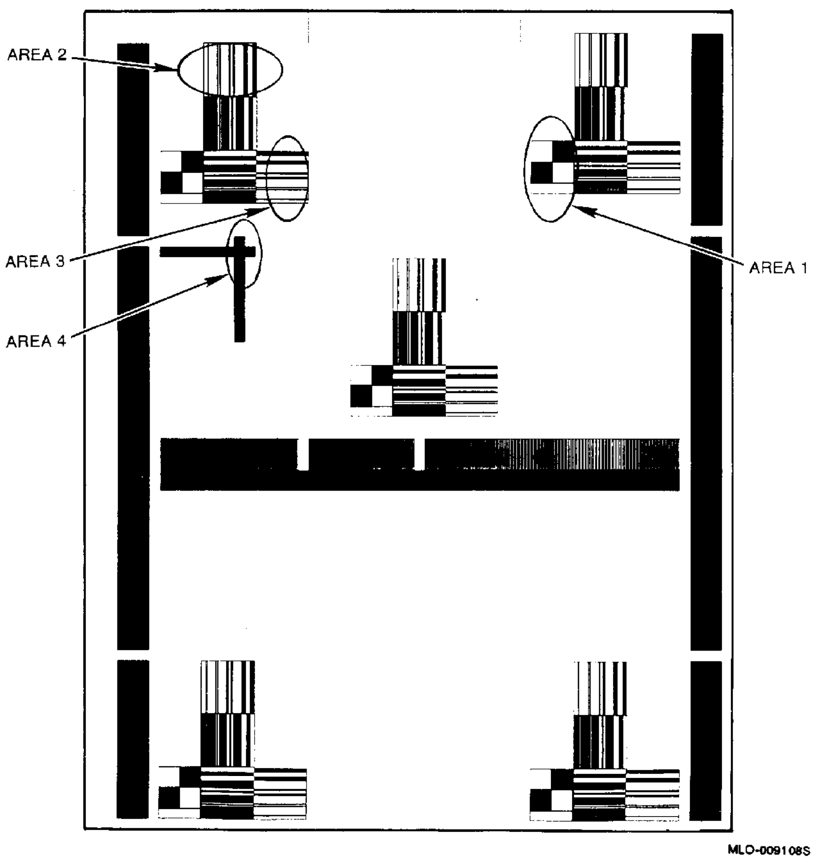
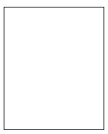


Figure 9–2 Pattern 0240

9.2 Blank or Very Light Images



Symptom: The image is very light or completely missing.

Analysis: The image is not being written on the OPC drum or no toner transfers to or from the OPC drum.

Solution: Do the following:

1. Check for toner. If If the toner level is low and no toner low message was displayed, suspect a failur of the developer unit or toner low sensor circuit. See Section 7.8.
2. Print a test sheet and stop the printer half-way through the print. Remove the OPC drum and inspect the developed image.
   - If **a dark image appears on the OPC drum** but does not transfer to the paper, check the following:
     a. Check the transfer/separation charger and connections.
     b. Swap the high-voltage power supply.
   - If **no image appears on the OPC drum**, a problem exists with a main charger, developer, or laser. Check the following:
     a. Make sure the development unit is tight against the OPC drum.
     b. Remove the developer unit and rotate the development roller gear clockwise. Check that the toner coats evenly and the roller does not bind. Swap the developer unit.
     c. Check and clean the OPC drum ground contact.
     d. Swap the print engine drive board.
     e. Swap the high-voltage power supply.
     f. Swap the zener diode and capacitor unit on the underside of the main charger guide or swap the main fan unit.
     g. Swap the optical unit.

9.3 Black Images

Symptom: The OPC drum is not being charged or the laser is always writing.

Analysis: Cover portion of the shield glass and run a test sheet.

- If the sheet does not show a blank area, the printer has a **charging problem.**
- If the sheet has a blank area, the printer has a **laser problem.**

Solutions:

Charging Problem

1. Check and clean the main charger. Check the contacts between the high-voltage socket and the charger. Swap as necessary.
2. Swap the high-voltage power supply.
3. Swap the print engine drive board.

Laser Problem Print the engine drive board test pattern.

1. If the test sheet is correct, replace the controller board.
2. If the test sheet is black, replace the print engine drive board or the optical unit.

9.4 Repetitive Marks

Symptom: Marks repeat parallel to paper movement.

Analysis: This problem is normally caused by damage to rollers that are part of the printing process. The distance between marks depends on the diameter of the damaged roller.

Solution: Measure the distance between the marks to determine the solution the problem.

2.16 inches (55 mm)	Examine the development roller. Remove contamination if possible and run 20 or more sheets. If the roller is physically damaged, replace the development unit.
7.40 inches (188 mm)	Examine the OPC drum and replace if necessary.
4.92 inches (125 mm)	Examine the fusing unit rollers for defects. If the red lower roller contains rips or gouges, find and remove the cause and replace the fusing unit.

Warning: *The fusing unit may be hot. Allow it to cool before handling.*

9.5 Distorted or Wavy Image

Symptom: The image twists in a wave-like pattern between the leading and trailing edges.

Analysis: The scan line is not in sync.

Solution: Check the following components. Clean and tighten as necessary.

1. High-voltage terminal contacts
   - Main charger wire
   - Main charger grid terminal
   - Grounding contacts
   - Development unit
   - OPC grounding terminal

   Swap the following, in order:

   1. Print engine drive board
   2. Optical unit
   3. Main processor fan
   4. High-voltage power supply

9.6 Fusing Failure

Symptom: The image is smudged or blurred and can be rubbed off the page. This problem should also cause a message on the Operator panel.

Analysis: Definite malfunction of the fusing current or heat sensing circuits.

Solution: Swap the following components:

1. Fusing unit
2. Development unit
3. Low-voltage power supply
4. Print engine drive board
5. Controller board

9.7 Blurred, or Smudged Image

Symptom: The image is smeared, smudged, or blurred but is fused correctly.

Analysis: Some thing is smearing the unfused toner. Suspect a speed regulation failure between the following components:

OPC drum and developer roller
Paper and OPC drum
Paper and fusing rollers

Solution: Examine the image on the OPC drum.

- If the image is **blurred**, inspect the developer and the OPC drive units. Swap the following:
  1. Make sure the set-screws that secure the OPC drive belt are secure and tightened.
  2. OPC drive belt
  3. Development motor unit
  4. main motor unit
- If the image is **not blurred**, perform the following:
  1. Examine the registration roller and clutch. Swap if necessary.
  2. Examine, clean, or replace the transfer/separation charger.
  3. Examine the paper feed rollers for wear or contamination that could cause paper to slip.
  4. Examine the fuser drive, fuser spring pressure, and entrance paper guides. Swap them if necessary.
  5. Look for loose items rubbing on the paper or other interference that disturbs the image before entering the fusing unit.

9.8 Paper Damage

Folds, creases, wrinkles, or dog-ears that occur from the feed area to the fusing unit are pressed flat by the fusing unit or registration rollers. Defects that occur after the fusing unit are not creased or pressed flat.

9.8 Paper Damage

Symptom	Analysis
The paper creases, wrinkles, and/or dog ears and the image prints over the defects. The image might print over the defect on both sides.	Damage occurred before the paper reached the transfer/separation charger.
The paper has wrinkles, creases, and folds along the leading or trailing edges. The image is skewed.	Before reaching the transfer/separation charger, the paper is skewed, causing the paper damage. Check the following components for wear or damage: Feed rollers Paper cassettes LCIT side rails Check the paper path for objects that may block the paper.
The paper has creases, wrinkles, or folds over the printing and the printing is distorted.	The damage occurred after the paper left the transfer/separation charger.
On a duplex page, both sides show a distorted image.	Damage occurred during the second pass, after the paper left the transfer/separation charger.
On a duplex page, the front side is printed over the defect but the back side image is distorted.	Damage occurred during the first pass, after the paper left the transfer/separation charger. Check for: Defective pressure roller Uneven contact between heat and pressure rollers Interference Defective or binding rollers in the paper path
The paper has tears or other damage to its leading edge.	If damage occurs only when the paper is sent to a certain output tray, check from the fusing unit to that output tray. If damage occurs when paper is sent to any output tray, check from the fusing unit to the feed unit.

9.9 Magnification

Symptom: Dimensional lines are shorter than normal and text appears cramped.

Reference: Figure 9–1, Pattern B This is intended as a check for dimensional accuracy of the printer. Pattern B is generated from a ROM bitmap with no programming involved. Use it when evaluating a print size problem that a customer customer might complain about.

Allowable Dimensions: Use a common ruler to measure the perimeter box dimensions on test pattern B. Normal dimensions are as follows:

- Width = 9 $\frac{3}{4}$ inches $\pm\frac{1}{8}$ inch (247 mm ±2.50 mm wide)
- Height = 7 $\frac{3}{4}$ inches $\pm\frac{3}{32}$ inch (195 mm ±2.00 mm).

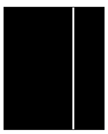
Analysis and Solutions : Determine if the magnification error runs *along* or *across* the scan line or leading edge.

Solution 1: If **Along** scan line, swap the optical unit.

Solution 2: If **Across** the scan line do the inspect or swap following components:

Main motor
Registration roller unit
OPC drum
Transport unit belt
Fusing unit, including pulleys, drive belts, gears, and so on.

9.10 White Line



Symptom: White lines or deletions appear on a print. This is not the same as white line jitter or white spots.

Reference: Any print

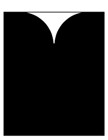
Analysis: The problem may result from the following:

Toner is not available for transfer to or from the OPC drum.
A mechanical defect is scraping toner from the unfused page.
The laser beam is obstructed.

Solution: Perform the following:

Clean the optical unit shield glass.
Examine the development roller for obstructions.
Examine the OPC drum and fusing unit rollers for grooves.

9.11 White Lines or Bands (Faded Areas)



Symptom: White lines or bands appear.

Analysis: The problem could be one of the following:

The laser is not discharging the drum correctly.
Toner application from the development unit.
The OPC drum is contaminated or streaked by light.
Toner is not correctly transferring from the OPC drum to the paper.
The fusing unit is dirty.

Solution: Check the following:

1. Check the toner level.
2. Examine the development unit and its connections. Swap if necessary.
3. Check and clean the transfer/separation charger. Swap if necessary.
4. Examine the OPC drum. Swap if necessary.
5. Examine the shield glass. Swap if necessary.

9.12 Skew

Symptom: The image is correct, but the image is skewed with reference to the edge of the paper. Figure 9–3 shows an example of skew and shows how to measure the skew using the engine board test pattern. Do not confuse skew with the margin adjustments shown in Section 12.4.

Reference: Figures 9–1, 9–2, or the engine drive board test pattern shown in Section 4.4.

Analysis: The primary causes of skew are feed failure, paper path obstructions, or damaged or missloaded media. A small amount of skew is corrected when the sheet is pushed into the nip of the registration rollers. This action will fail to correct a badly skewed sheet and that sheet might pass through the duplex paper path and be skewed on both sides.

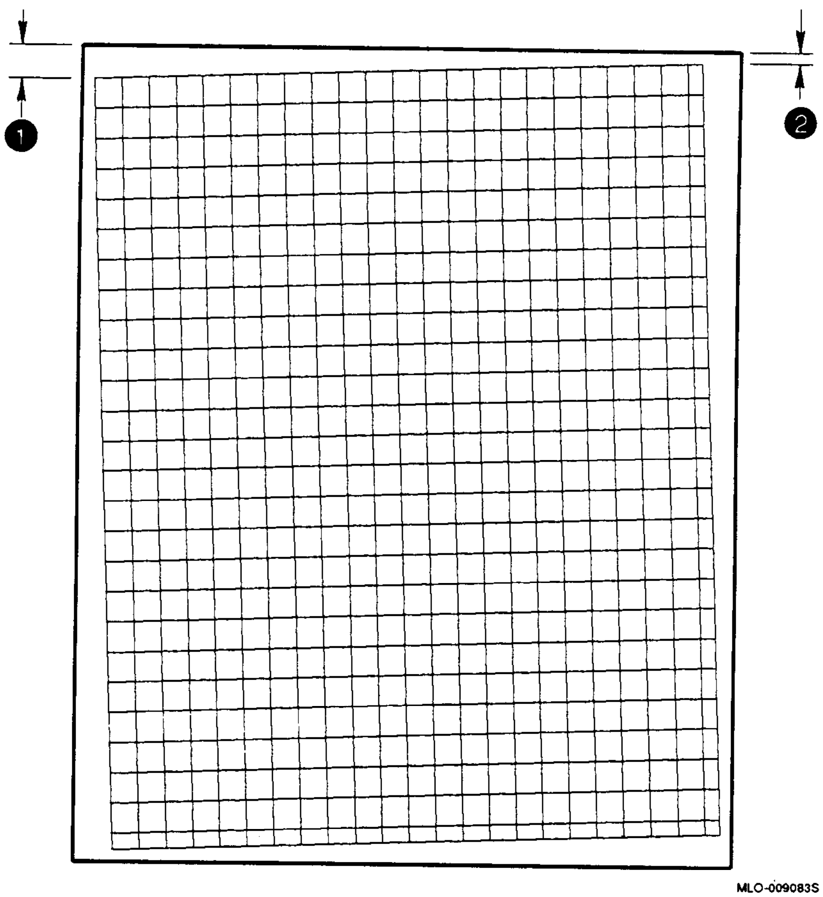
Measure points ❶ and ❷ and subtract the two measurments. The difference between the two measurements must be less than $\leq\frac{3}{23}$ inch (2 mm).

More then that amount of skew is noticable and might be objectionable, even though it is within specification.

Solution: Skew of less then $\leq\frac{3}{23}$ inch is not noticable to the human eye.

- Check the quality of the paper.
- If the paper is dog-eared, wrinkled, creased, or folded go to Section 9.8, Paper Damage.
- Check the input trays for correct adjustment.
- Check the input and registration rollers for wear.

Figure 9–3 Image Skew Example



9.13 Density Defects

Symptoms: The three different types of density defects are:

1. **density evenness** A noticable difference in the darkness between one or more of the four areas on the pattern B or 0303 test prints. A 20% difference is just perceptible.
2. **solid area density** The area is not a consistent matte black; has voids or fading; the edges and corners are not sharp and straight.
3. **image evenness density** The density (darkness) varies across the sheet. Light patches appear in dark areas and light areas fade.

Reference 1 & 2: Figures 9–1 or 9–2, Area 1

Allowable Level 2: 1.25, compare with Figure 9–4.

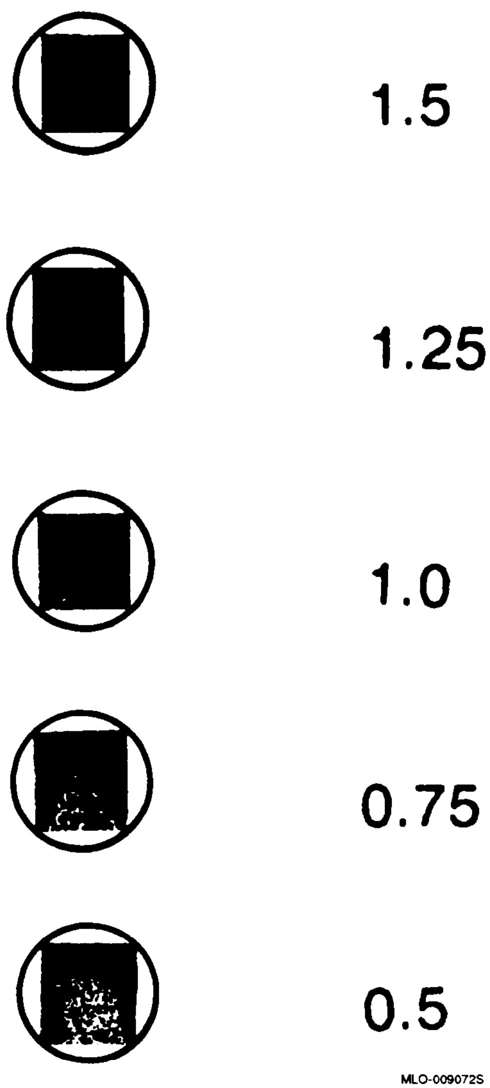
Analysis 1 & 2 & 3: Examine several prints. If the uneven density appears at the same distance from the side of the page, but varies in the direction of the print, the OPC drum is contaminated or deteriorated due to light exposure or contamination.

If the uneven density appears in random spots, suspect the development unit and connections, detach, and transfer charge units.

Solution 1 & 2 & 3: Perform the following:

1. Try fresh paper. Paper in trays could be damp.
2. If the printer is not level, toner accumulates at one end of the toner hopper. Deploy the printer's adjustable feet and level the printer.
3. Examine, clean, or swap the high-voltage contacts and sockets of the main and transfer/separation chargers.
4. As the development drawer closes, inspect operation of the springs, cams, and drive gear. Make sure the development unit closes tightly against the OPC drum.
5. Check/replace the OPC drum and grounding terminal.
6. Check/replace the high-voltage power supply.
7. Swap the charge wire zener.

Figure 9–4 Image Density



9.14 Background Density

Symptom: The white background of the page is graying.

Reference: Figure 9–1 or any unprinted white area of the test print.

Allowable Level: 4.0, compare with Figure 9–5.

Analysis: The OPC drum is picking up toner on blank areas or is not being completely cleaned.

Solution: Perform, inspect and swap the following:

TCC procedures, as shown in Appendix B.
Cleaning unit
Quenching lamp
Charging units(clean the units first)
OPC drum (if it is deteriorated or dirty)
High-voltage power supply
Optical unit.

9.15 Dirty Second Side

Symptom: The second side has a barely perceptible graying, compared with an unused sheet. If a dirty second side occurs during the first pass of a duplex operation, the problem could be confused with background density on the second printed side.

Allowable Level: 4.0, compare with Figure 9–5.

Analysis: The problem may result from the following:

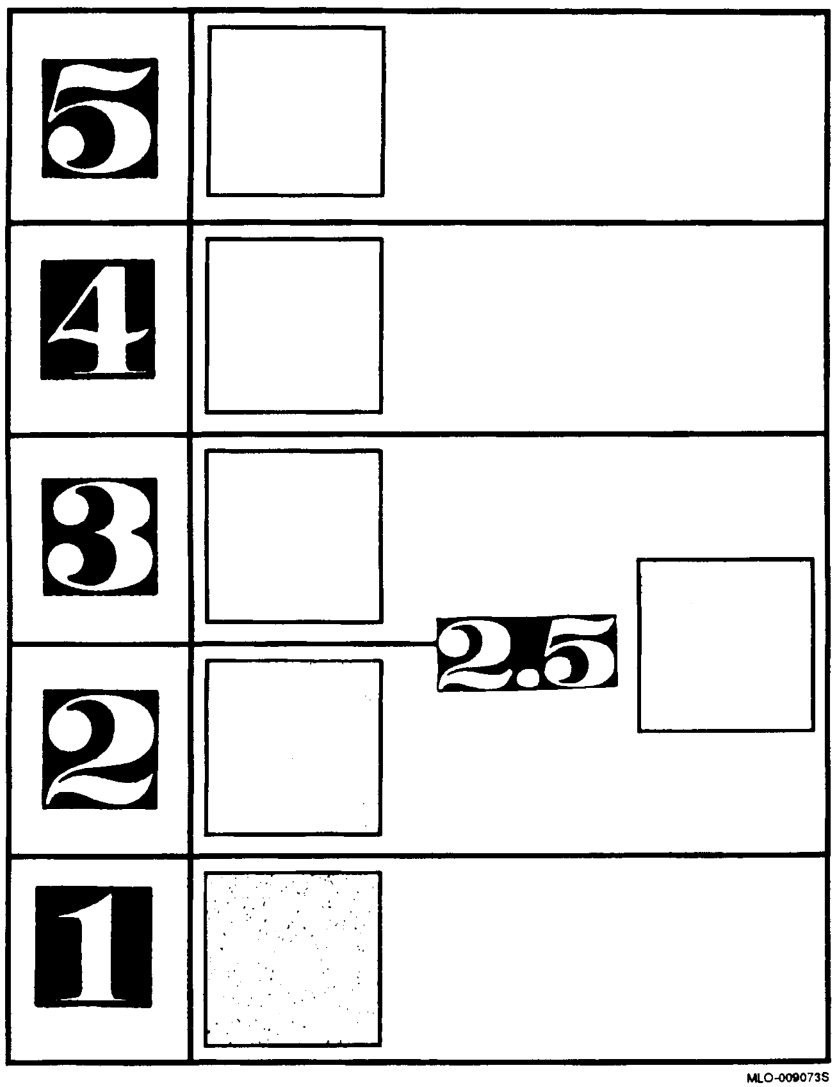
The OPC drum is not being completely charged.
The cleaning unit is failing or is overwhelmed.

Solution: Perform the following:

TCC procedures, as shown in Appendix B.
Check/replace the quenching lamp.
Check/replace the cleaning unit.
Check/replace the main and transfer/separation chargers.
Check the high-voltage contacts.
Swap the high-voltage power supply.

9.15 Dirty Second Side

Figure 9–5 Background Density or Dirty Second Side



9.16 Filling

Symptom: The lines are unclear and may have voids. Blackening appears between the two lines.

Almost identical to Section 9.13 in Section 9.13.

Reference: Figures 9–1 or 9–2, Areas 2 and 3

Allowable Level: 4.0, compare with Figure 9–6.

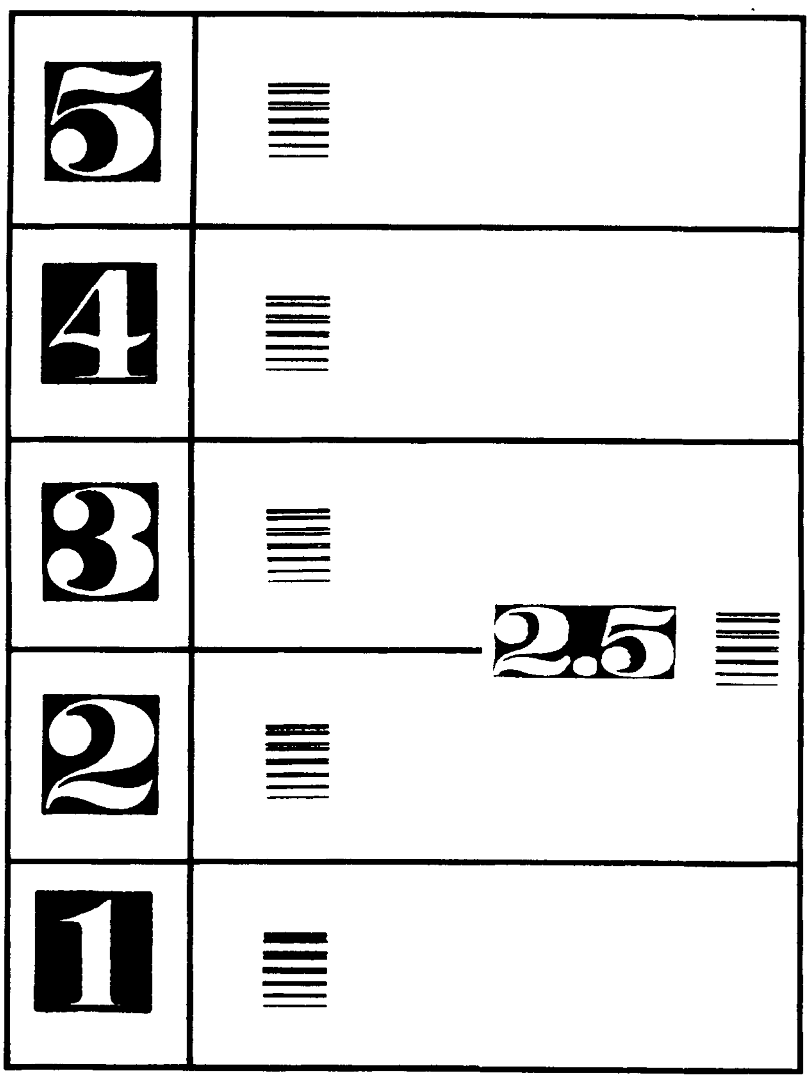
Analysis: Toner is being distributed unevenly.

Solution: Perform the following:

TCC procedures, as shown in Appendix B.
All the steps in Section 9.13.

9.16 Filling

Figure 9–6 Filling



9.17 Letter Quality Resolution

Symptom: The large (C) and (RR) symbols are unclear with broken lines and some degree of filling.

Reference: Figure 9–2, Pattern 0240

Allowable Level: 4.5, compare with Figure 9–7.

Analysis: The toner is being distributed too lightly or too heavily.

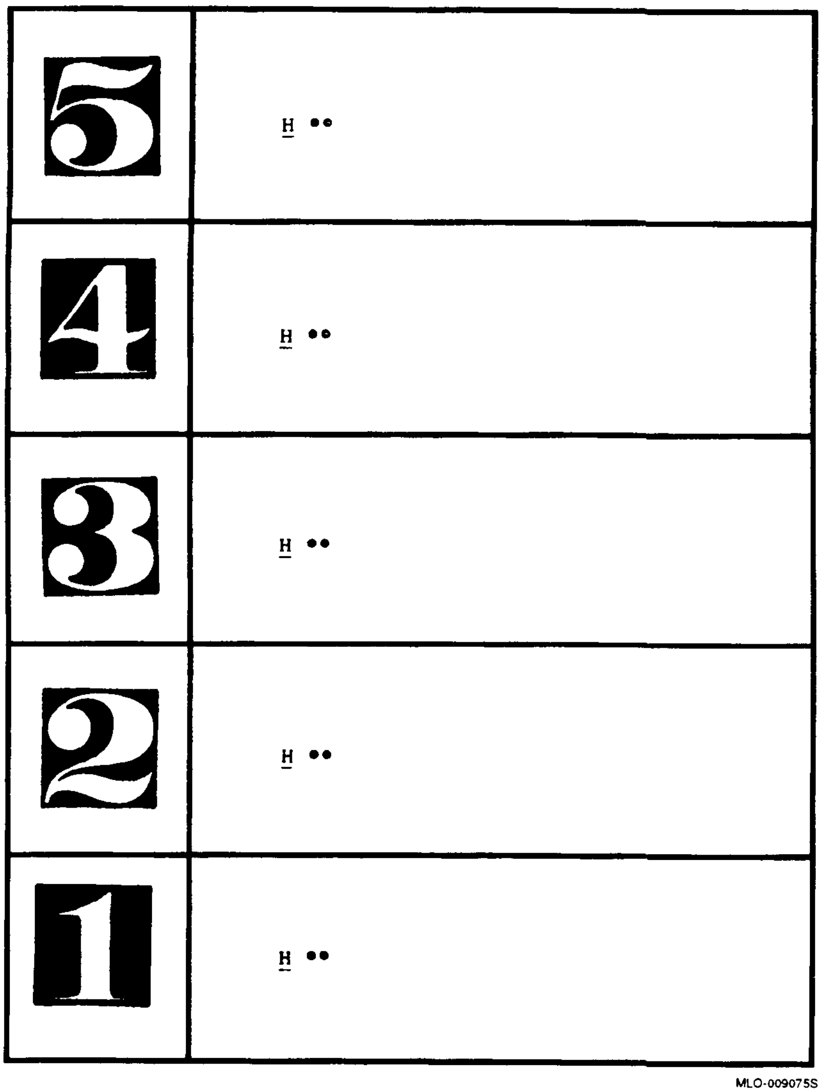
The print may show other symptoms, such as dirty background, voids, or character edge fade.

Solution: Perform the following:

See Section 9.13.
TCC procedures, as shown in Appendix B
Check/replace the quenching lamp.

9.17 Letter Quality Resolution

Figure 9–7 Letter Quality Resolution



MLO-009075S

9.18 Legible Character

Symptom: The printed characters are broken or filled.

Reference: Figure 9–2

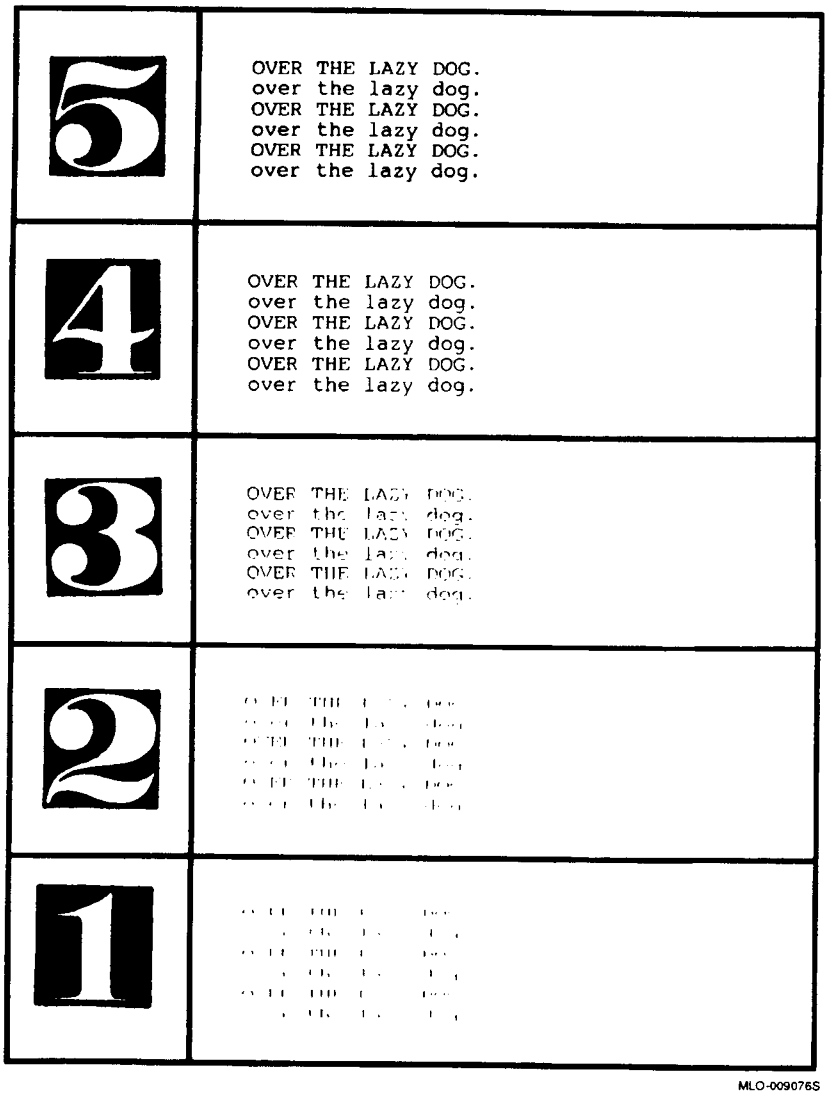
Allowable Level: 4.5, Compare with Figure 9–8

Analysis: The toner is being distributed too heavily or lightly. The problem may be accompanied by background voids, character edge fade, or other problems.

Solution: See Section 9.13 and perform TCC procedures, as shown in Appendix B.

9.18 Legible Character

Figure 9–8 Legible Character



9.19 Character-edge or Black-edge Fade

Symptom: The lines are straight and square but fade at the corners.

Reference: Figures 9–1 or 9–2, Area 4

Allowable Level: 4.0, Compare with Figure 9–9.

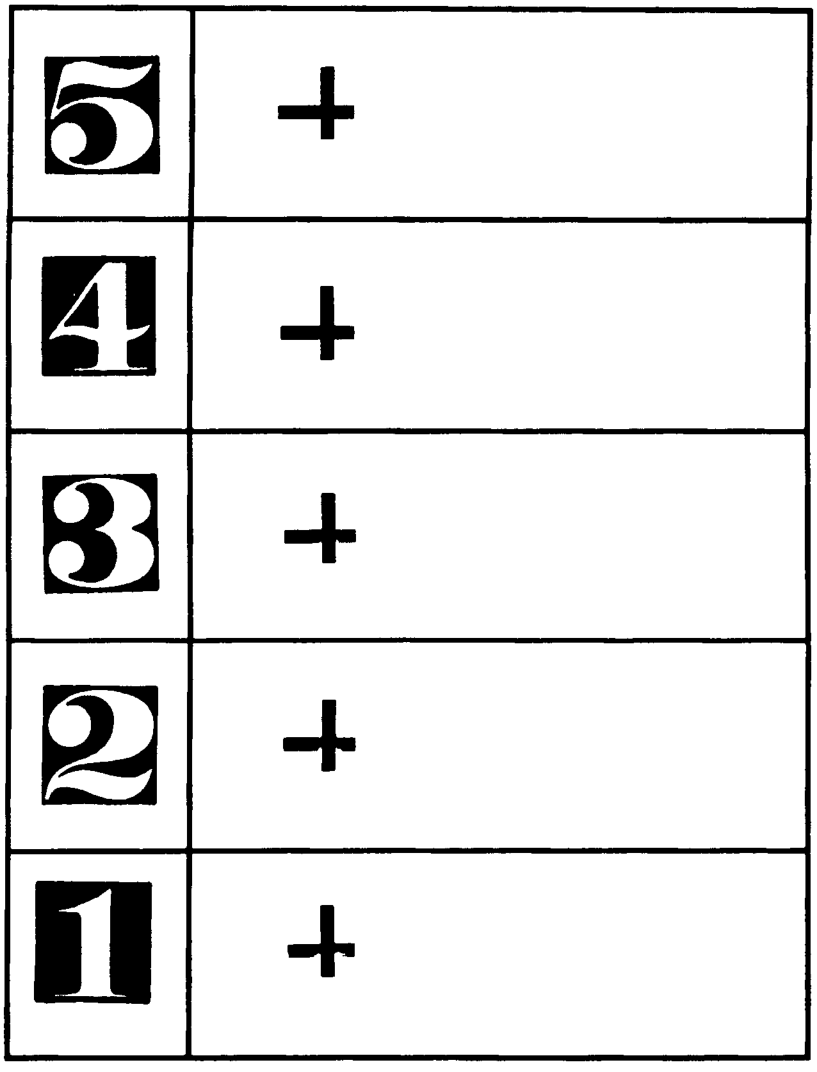
Analysis: The following may be causing the problem:

The toner is not being distributed evenly.
The OPC drum is not being charged properly.
The toner is not transferring correctly from the OPC drum to the paper.

Solution: See Section 9.13 and and perform the TCC procedures, as shown in Appendix B.

9.19 Character-edge or Black-edge Fade

Figure 9–9 Character-edge or Black-edge Fading



9.20 White Spot

Symptom: Black or gray areas contain white spots.

Reference: Any solid black area of the test print

Allowable Level: 3.0, compare with Figure 9–10

Analysis 1: If the spots are random, the problem is caused by poor charging, developing, or transfer.

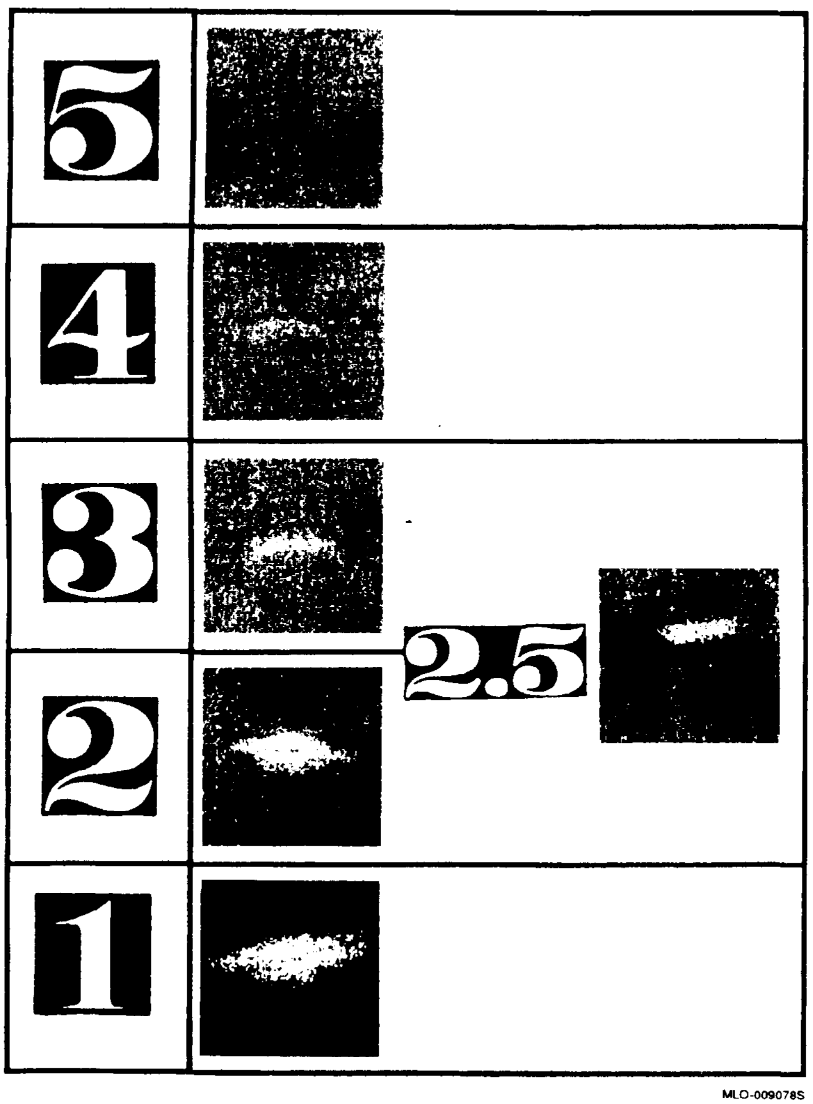
Analysis 2: If the spots appear at regular intervals, the problem is caused by blemishes in the OPC drum or development unit areas.

Solution 1: Perform solutions in Section 9.13 and the TCC procedures, shown in Appendix B.

Solution 2: Perform procedures in Section 9.11, White Lines or Bands (Faded Areas).

9.20 White Spot

Figure 9–10 White Spot



9.21 White Void

Symptom: Closely printed areas fade.

Reference: Any print with solids or half tone areas.

Allowable Level: 3.0, compare with Figure 9–11.

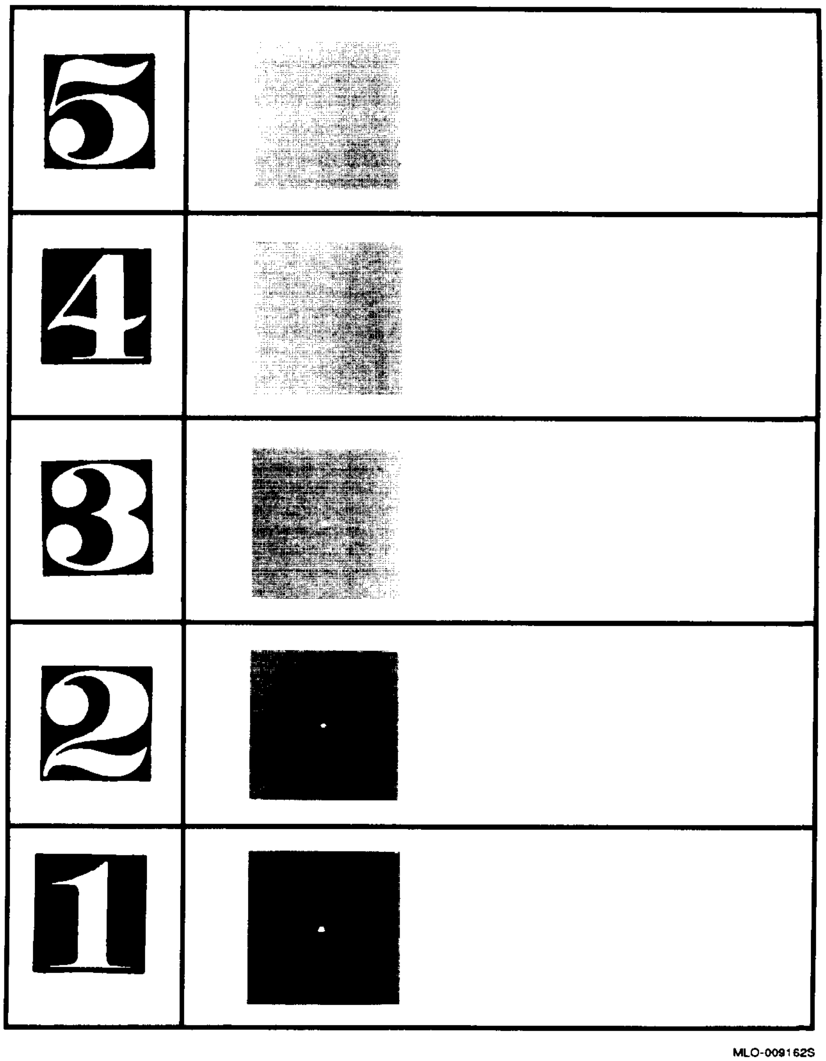
Analysis: The problem may be caused by the following:

Low toner
Poor development
Dirty areas on the OPC drum
Dirty fusing unit rollers

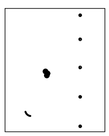
Solution: See Section 9.13 and TCC procedures, shown in Appendix B.

9.21 White Void

Figure 9–11 White Void



9.22 Black Spots or Clusters



Symptom: Single or clusters of black spots in the white areas of the page. Caused by escaped toner that falls on the sheet.

Allowable Level: 4.0, compare with Figure 9–12.

Analysis 1: Toner is leaking from the development unit or cleaning unit. The cleaning unit could be full and the warning circuit is not working.

Shaking the cleaning unit or violently opening or closing the development drawer can trap the cleaning unit full flag in the empty position (toward the OPC drum).

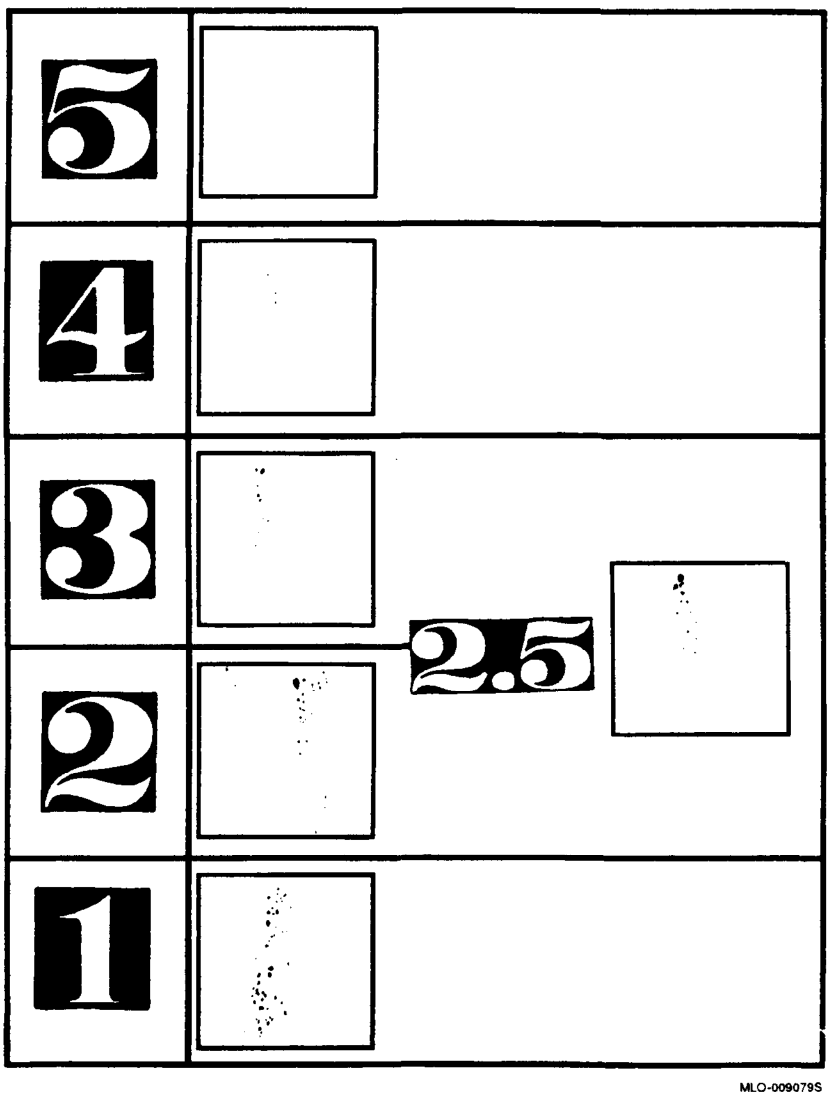
Solution 1: Perform the following:

1. Inspect the area around the developer roller. If there is evidence of leaking, replace development unit.
2. Examine the area around the cleaning unit. If the unit is full, replace it.

Solution 2:: If the flag is in the full position and the Cleaning Unit Full message does not appear, go to Section 7.43.

9.22 Black Spots or Clusters

Figure 9–12 Black Spot



9.23 Black Line

Symptom: Random lines appear in unprinted areas. This is not the same as black line jitter or black spots.

Reference: Any print

Allowable Level: 3.0, compare with Figure 9–13.

Analysis: The problem may result from the following:

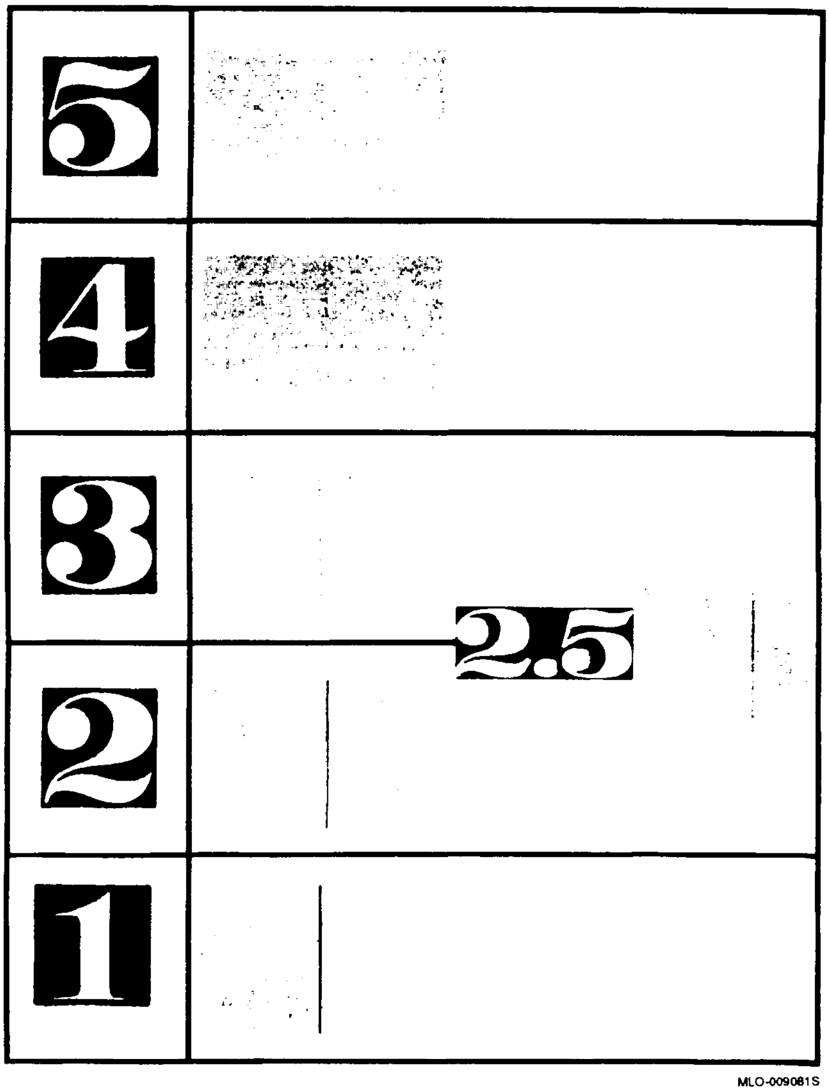
Spurious streaks of toner from the development unit
Improperly cleaned OPC drum
Damaged transfer wires
Leaking cleaning unit

Solution: Perform the following:

Examine the cleaning unit's mylar blade for damage.
Examine the OPC drum and fusing unit rollers.
Examine the development roller.
Clean/replace the main charger.

9.23 Black Line

Figure 9–13 Black Line



9.24 Dirty Edges

Symptom: A $\frac{1}{4}$ inch (5 mm) border strip appears on any edge of the sheet.

Allowable Level: 4.0, compare with Figure 9–14.

Analysis: The problem may result from the following:

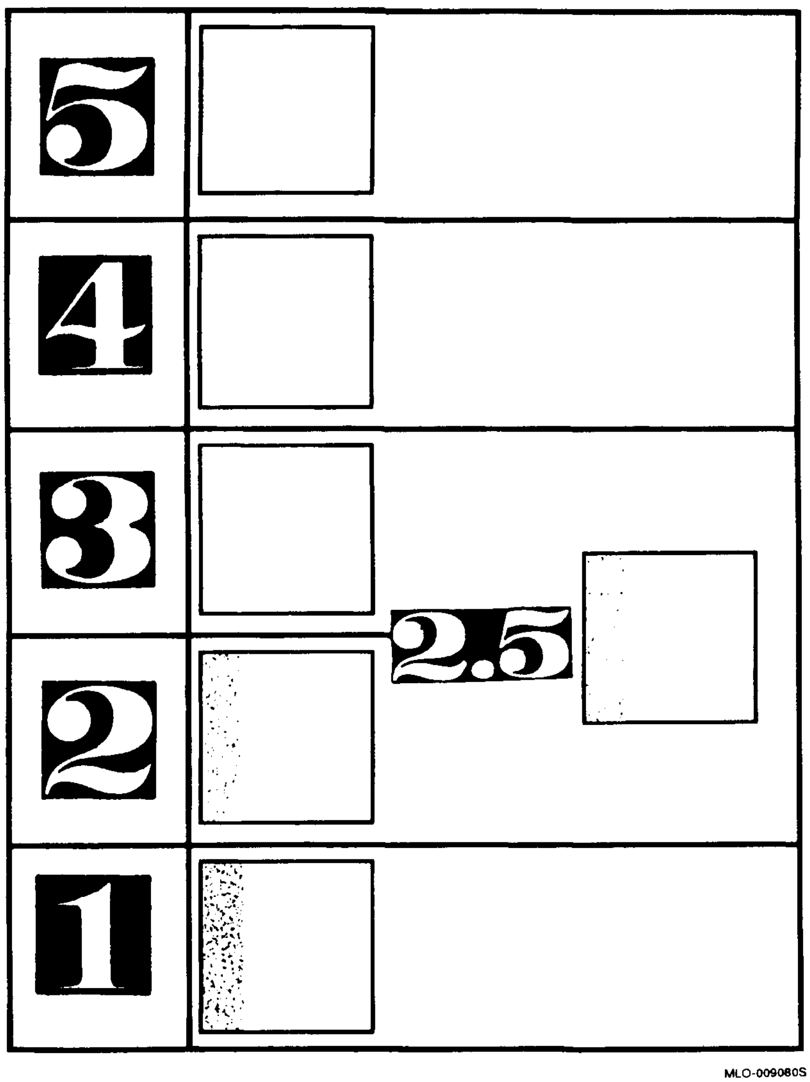
The OPC drum is being incorrectly charged.
The cleaning unit is failing or is overwhelmed.

Solution: Perform the following:

TCC procedures, as shown in Appendix B.
Check/replace the quenching lamp.
Check/replace the cleaning unit.
Check/replace the transfer charger.
Check/replace the main charger.
Check the high-voltage connections.
Swap the high-voltage power supply.

9.24 Dirty Edges

Figure 9–14 Dirty Edges



10

FRU Removal and Replacement

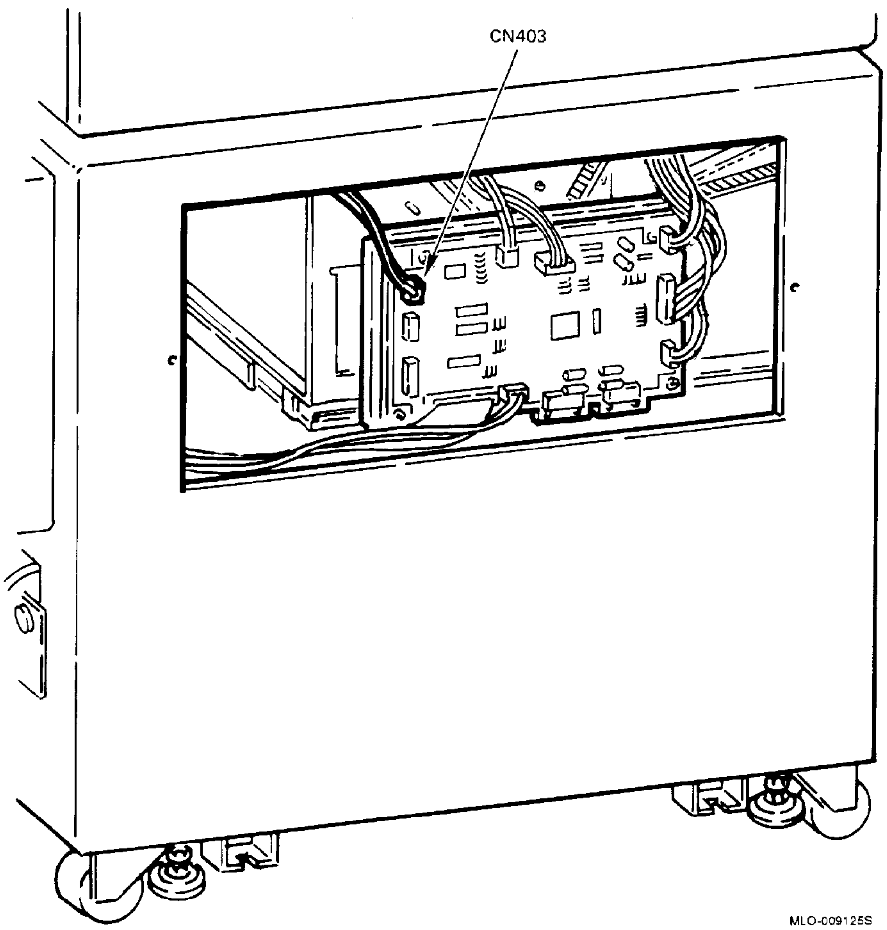
This chapter explains how to remove and replace field replaceable units (FRUs) and associated parts in the PrintServer 32. Each procedure provides steps for removing the FRU. To replace the unit, perform the steps in reverse.

Warning: *To prevent personal injury, be sure the power is off before removing or replacing any parts. Also, the metal edges on some parts are very sharp; be careful when removing or replacing parts.*

10.1 Cabinet Paper Feed Unit

Remove the cabinet paper feed unit as follows:

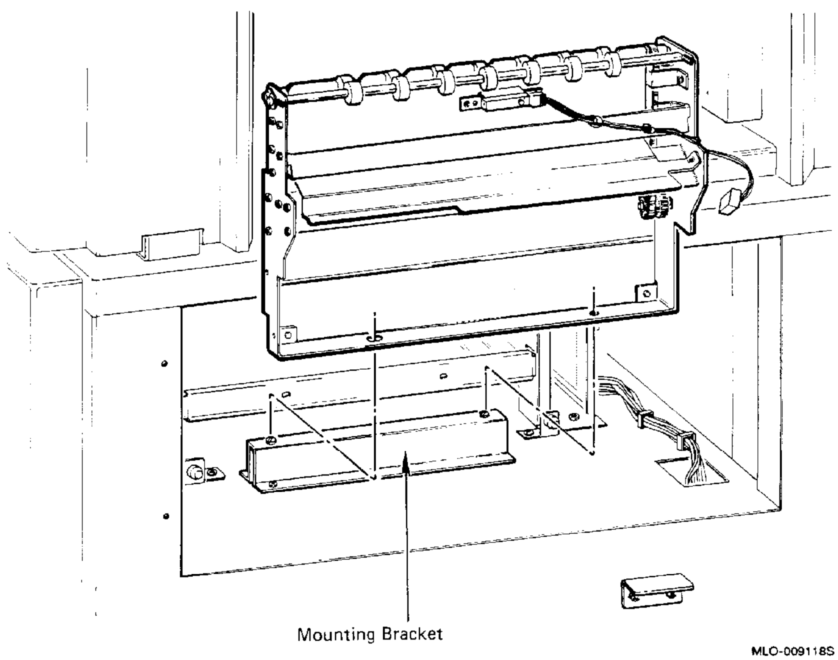
1. Remove the LCIT (Section 10.18).
2. Remove the LCIT feed unit (Section 10.17).
3. Disconnect the feed unit cable from the duplexer/LCIT drive board (CN403).



4. Lift the feed unit up from the bottom just enough to clear the alignment pins on the mounting bracket and then pull the unit out.

   Adjustments: *After replacing this component, perform the adjustments specified in Table 12–2.*

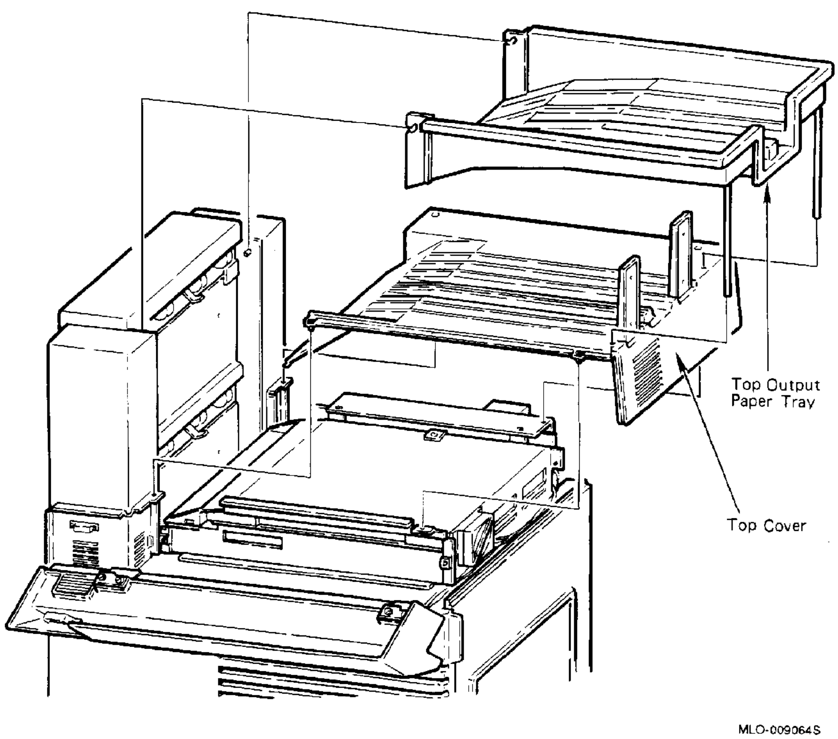
   Note: *The feed unit requires an exact position in the cabinet to feed paper properly. Because of this close tolerance, the feed unit may fit tightly in the cabinet. When installing the feed unit, insert it so that the top is in position first and then slide the bottom over the alignment pins on the mounting bracket.*



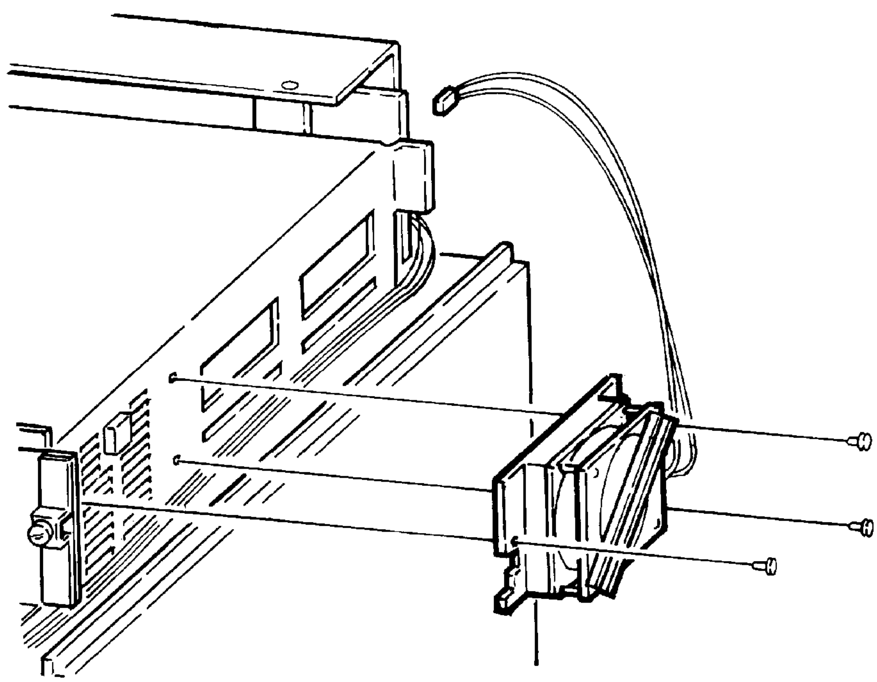
10.2 Card Cage Fan

Remove the card cage fan as follows:

1. Remove the top output paper tray.
2. Remove the rear cover (Section 10.26).
3. Open the operator panel cover.
4. Remove the top cover by loosening its four screws.



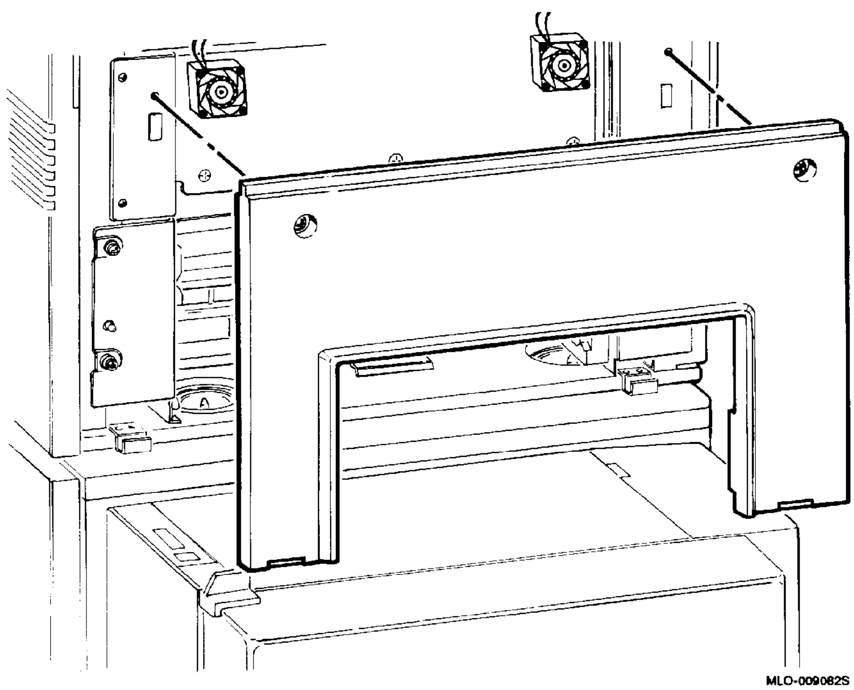
5. Disconnect the fan cable (CN122) from the mother board and remove it from the wiring harness retainers.
6. Remove the fan (with bracket) by removing the three bracket screws.



10.3 Cassette Paper Feed Unit

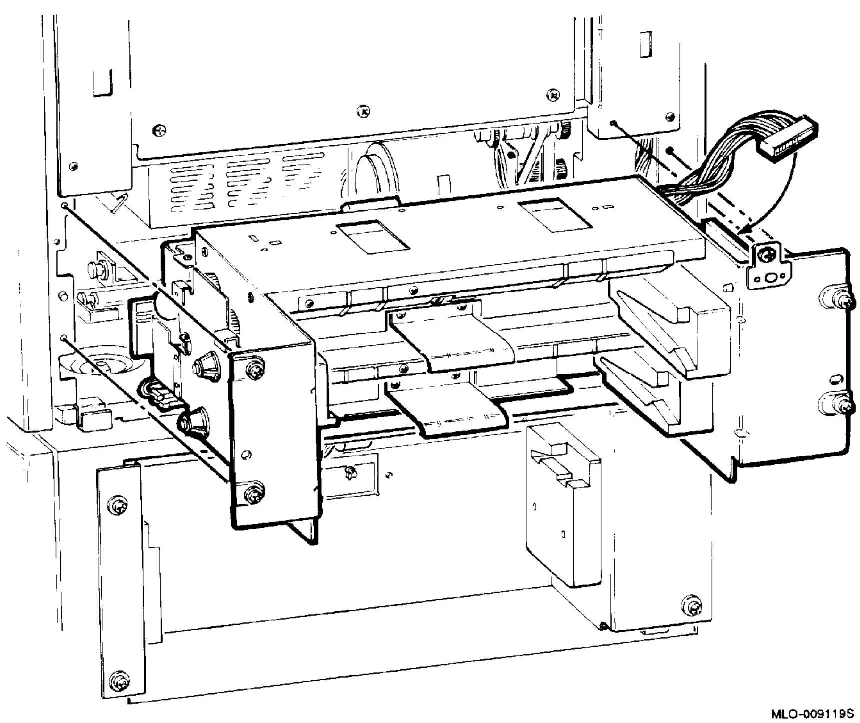
Remove the cassette paper feed unit as follows:

1. Power down the printer and remove the line cord.
2. Remove the paper cassettes.
3. Loosen the two screws that hold the top of the side cover to the printer.
4. Push down and swing the right side cover away from the printer.
5. Lift and side cover off the lower hinge bracket and remove it.



6. Remove the non-captive screw that holds the feed unit to the bulkhead above it.
7. Loosen the four captive screws that hold the paper feed unit to the vertical side rails of the printer.
8. Pull the paper feed unit out a few inches disconnecting the latch that holds the inside of the unit to the floor of the printer.
9. Unplug the 30-pin CN521 connector from the control board of the feed unit.
10. Remove the feed unit by pulling it out of the printer.

   Adjustments: *After replacing this component, perform the adjustments specified in Table 12–2.*



10.4 Charge Wire Zener

Use the following to remove and replace the zener diode from the main fan housing.

- Remove the quench lamp, main charger, and main fan unit, as shown in Section 10.25.
- Remove the two screws and remove the zener diode.
  - The + lead connects to the frame (ground) and is secured with a large screw.

Figure 10–1 NEW ART 10-JUN-1992 16:23:420

SHOW TWO SCREWS EXPLODING OUT. SHOW + LEAD.

10.5 Charge Wire Cleaning Motor

Use the following procedure to remove and replace the motor that operates the charge wire cleaner:

1. Remove the rear cover (Section 10.26).
2. Unplug the 16-pin, CN111, and 8-pin, CN109, from the mother board.
3. Unplug the 2-pin connector that connects the charge motor to the cable harness.
4. Loosen the two captive screws that hold the motor to the printer.
5. Slide the motor to the right, and remove it.

REVIEWER'S Note:: *The motor in the pre-production unit was very sensitive to the amount of torque applied to the mounting screws. This procedure must be checked on a final production motor.*

Show 3 connectors. Show cables hanging. Show 2 screws. Show the zigzag pattern to remove the motor.

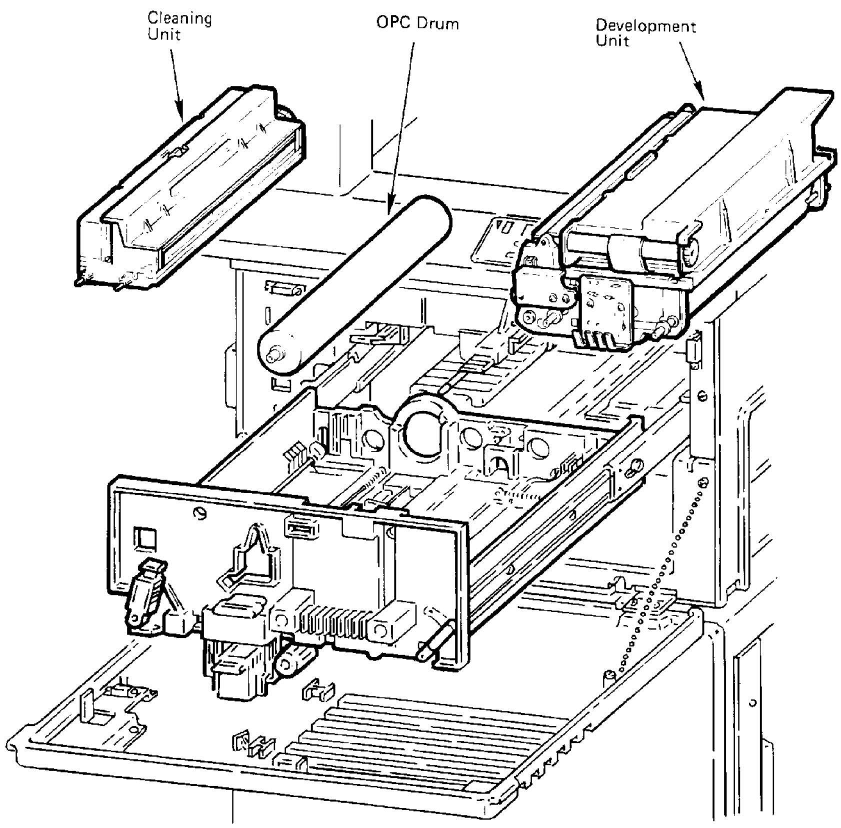
10.6 Developer, Cleaning Units, OPC, or Drawer

Remove the development drawer as follows:

1. Remove the transfer/separation charger as shown in Section 10.30.
2. Remove the registration roller unit (Section 10.27).
3. Turn the development unit release lever clockwise to disengage the development unit from its operating position.
4. Remove the development unit (with the toner cartridge) by lifting it up and out of the drawer.
5. Press the top of the cleaning unit release lever to disengage the cleaning unit from its operating position.
6. Remove the cleaning unit from the drawer.
7. Remove the OPC drum from the drawer.

   Caution: *Place the drum on a clean cloth or paper and cover it to protect the drum surface from exposure to light. When handling the drum, do not get fingerprints on the drum surface. Fingerprints damage the surface of the drum and produce print quality problems.*

10.6 Developer, Cleaning Units, OPC, or Drawer



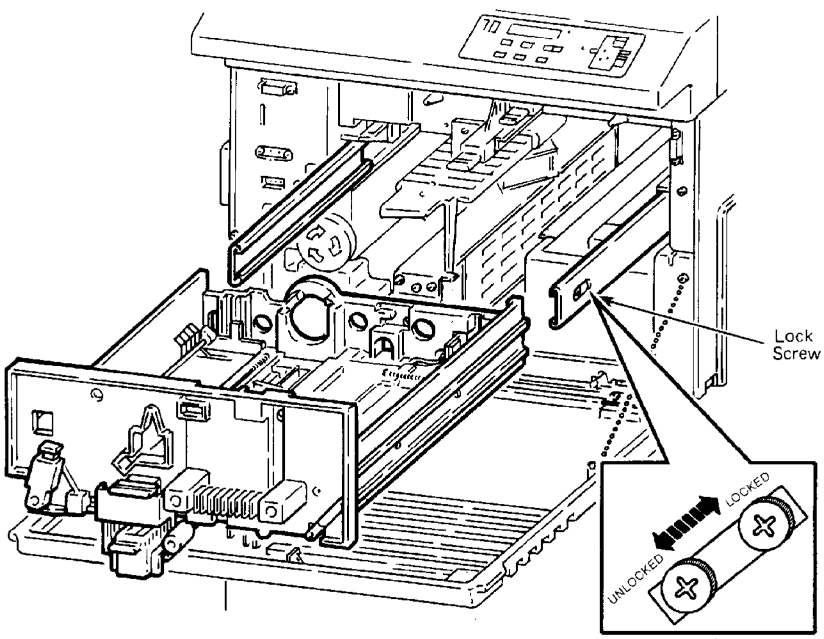
10.6 Developer, Cleaning Units, OPC, or Drawer

8. Loosen the drawer lock screws (left and right sides) and slide them forward.

   → Retighten the screws in the forward position.

9. Remove the drawer by sliding it straight out.

   Adjustments: *After replacing this component, perform the adjustments specified in Table 12–2.*



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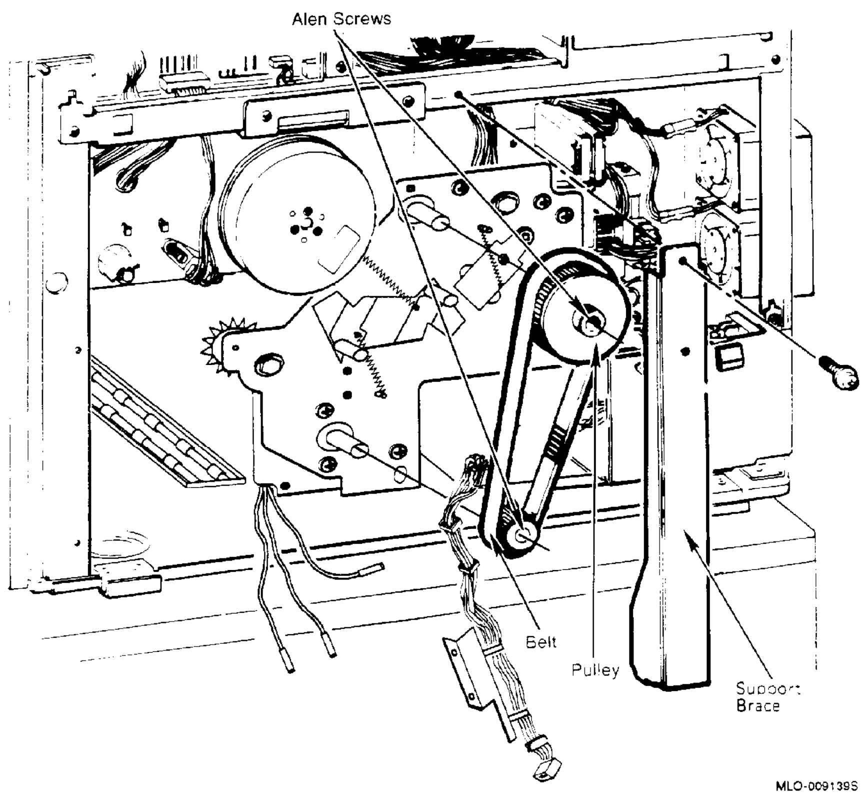
10.7 Development Motor Unit

Check removal and replacement of the bracket.

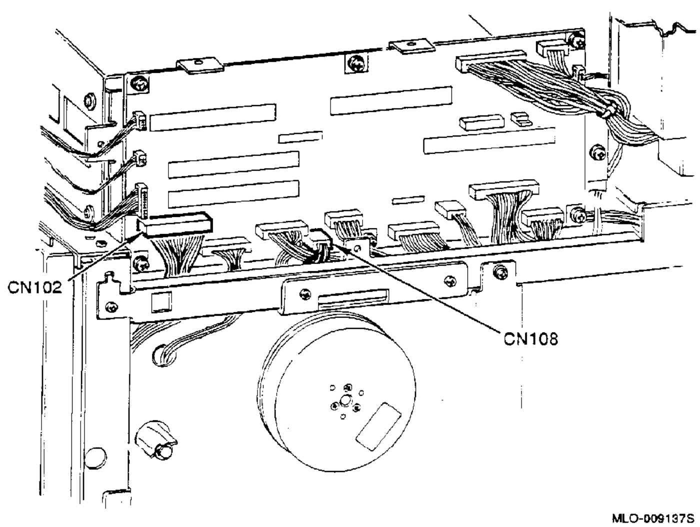
Use the following procedure to remove the development motor unit:

1. Remove the cassette paper feed unit (Section 10.3).
2. Remove the high-voltage power supply (Section 10.15).
3. Remove the screw that holds the support brace to the chassis.
4. Remove the support brace.
5. Loosen the Allen screws on the drive and driven pulleys.

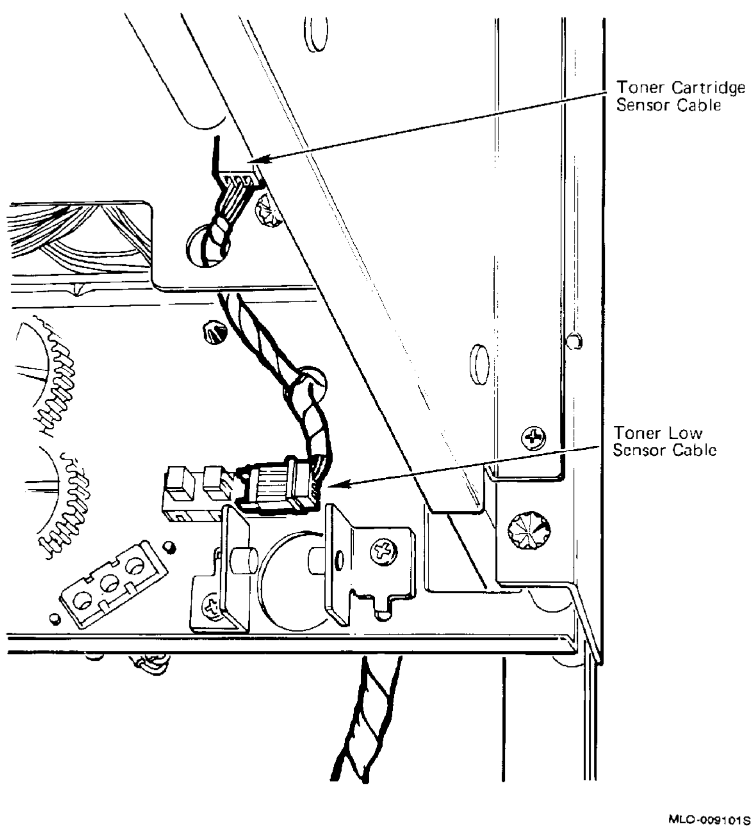


10.7 Development Motor Unit

7. Open the front cover and pull out the development drawer.
8. Cover the OPC drum with several sheets of paper, so it will not be exposed to the light.
9. Disconnect the development motor cable (CN108) from the mother board.
10. Disconnect the paper feed cable (CN102) from the mother board.

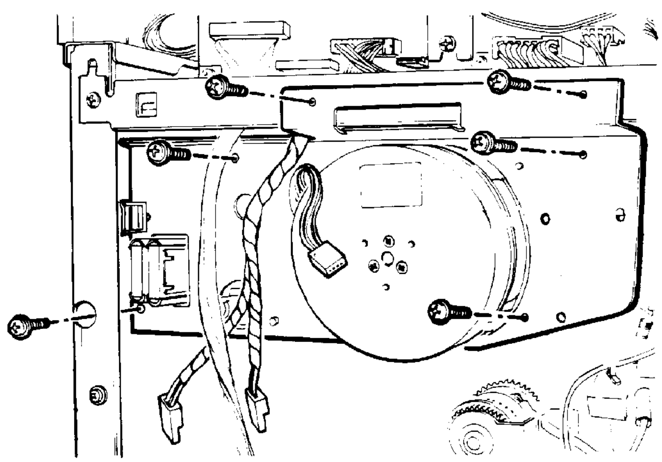


11. Disconnect the following two sensor cables from their sensors. The best way to access these sensors is from the right side of the printer through the opening where the cassette paper feed unit usually resides.
    a. Disconnect the toner cartridge sensor cable from its sensor and run it through the hole in the chassis.
    b. Disconnect the toner low sensor cable from its sensor and run both sensor cables through the hole in the development motor unit.



10.7 Development Motor Unit

12. Remove the OPC drum change sensor screw.
13. Remove the seven six that hold the motor bracket to the printer.
14. Remove the development motor unit.



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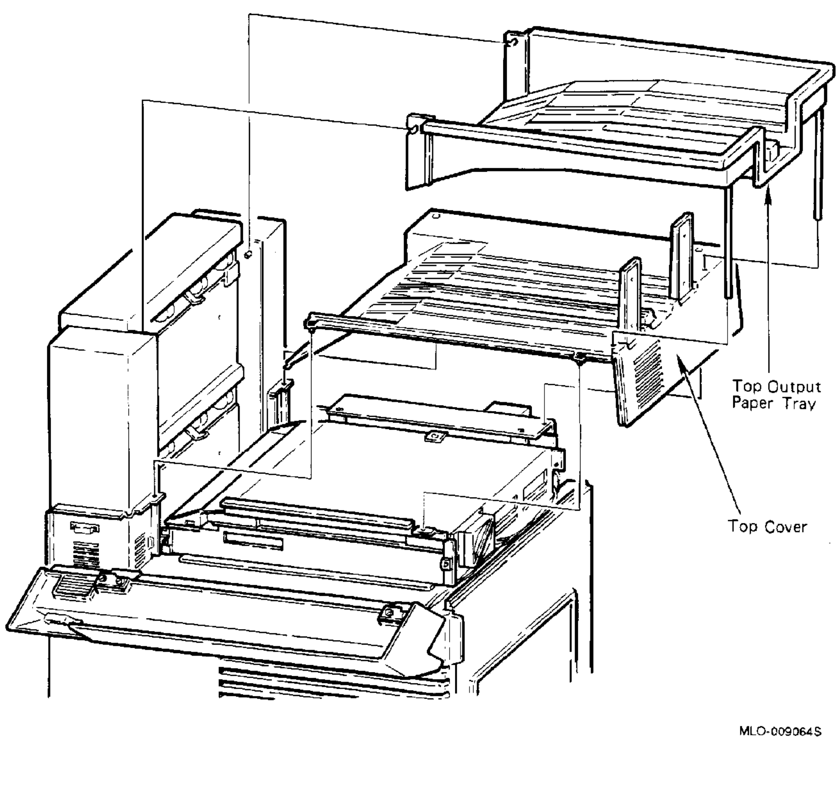
10.8 Development Unit Fans

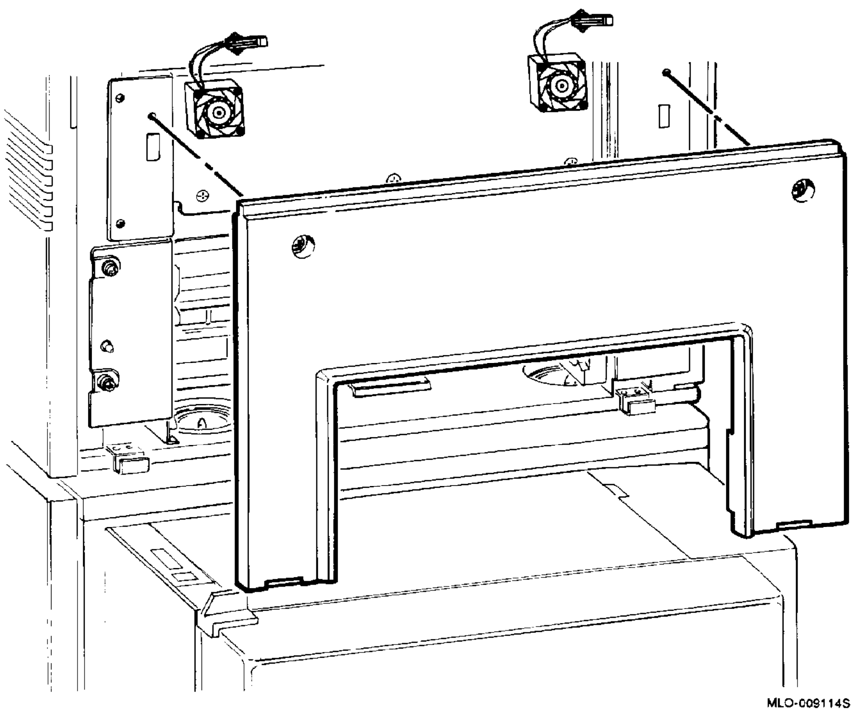
Use the following procedure to remove and replace either of the two fans that cool the development unit:

1. Remove the rear cover (Section 10.26).
2. Remove the top output paper tray.
3. Open the operator panel cover.
4. Remove the top cover by loosening its four screws.



10.8 Development Unit Fans

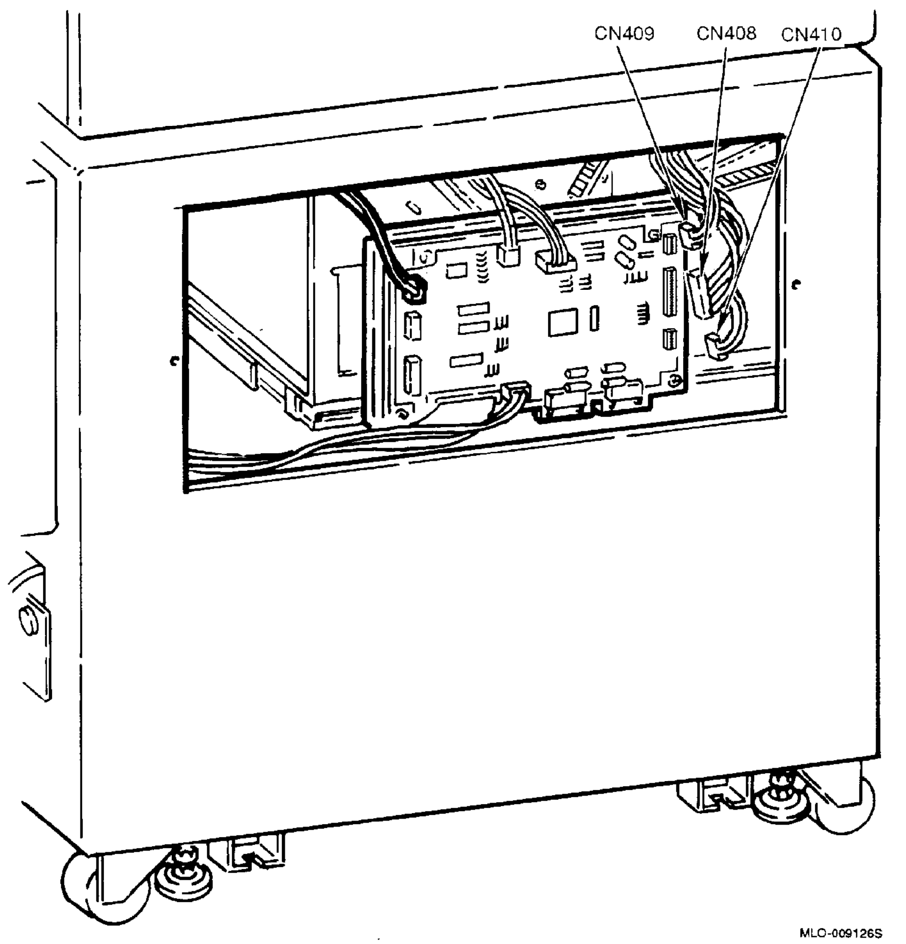
5. Remove the paper cassettes.
6. Loosen the two screws that hold the top of the side cover to the printer.
7. Lift and side cover off the lower hinge bracket and remove it.
8. To remove either fan, unplug the 2-pin connector and remove the two screws.



10.9 Duplexer Unit

Remove the duplexer unit as follows:

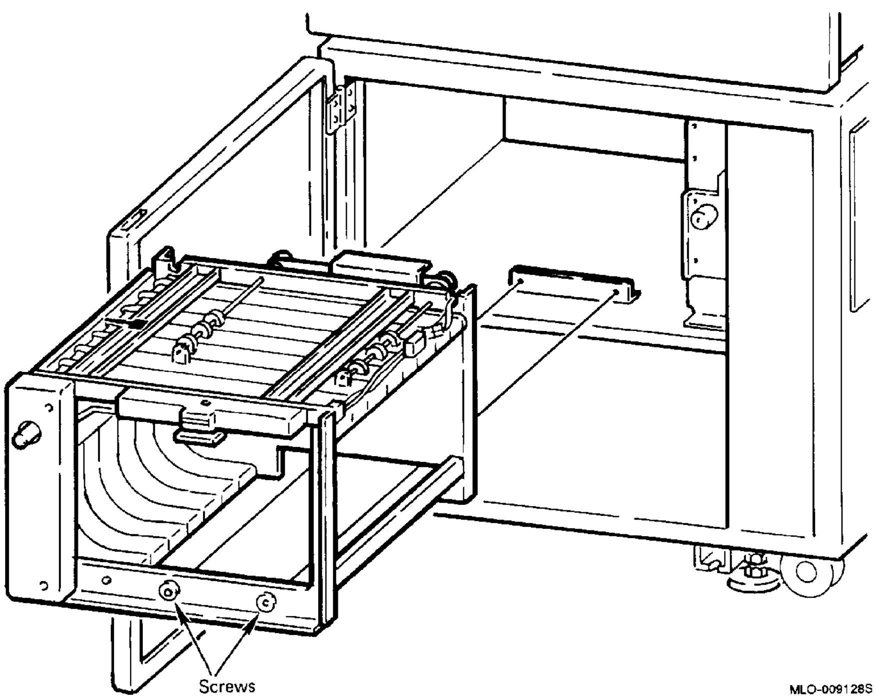
1. Remove the rear cover of the cabinet by loosening its two screws.



10.9 Duplexer Unit

3. Open the cabinet door.
4. Loosen the two captive screws that hold the duplexer unit to the cabinet.
5. Pull and remove the duplexer unit.

   Adjustments: *After replacing this component, perform the adjustments specified in Table 12–2.*

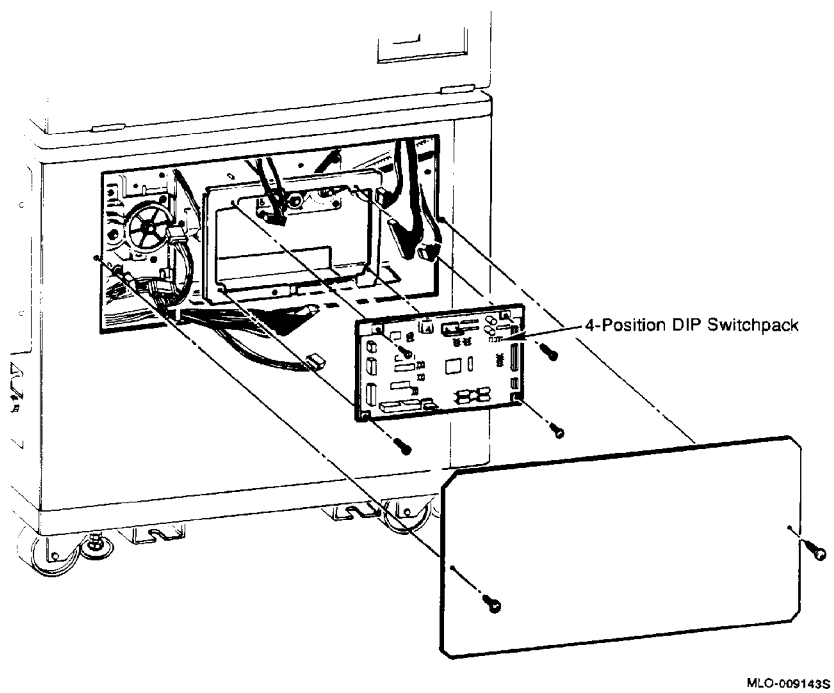


10.10 Duplexer/LCIT Drive Board

Remove the duplexer/LCIT drive board as follows:

1. Remove the rear cabinet cover by removing its two screws.
2. Disconnect all the cables from the drive board.
3. Remove the 4 screws that hold the drive board to the bracket.
4. Remove the drive board.
5. When replacing the duplex/LCIT control board, make sure you set all four switchpack switches to **off**.

   Adjustments: *After replacing this component, perform the adjustments specified in Table 12–2.*

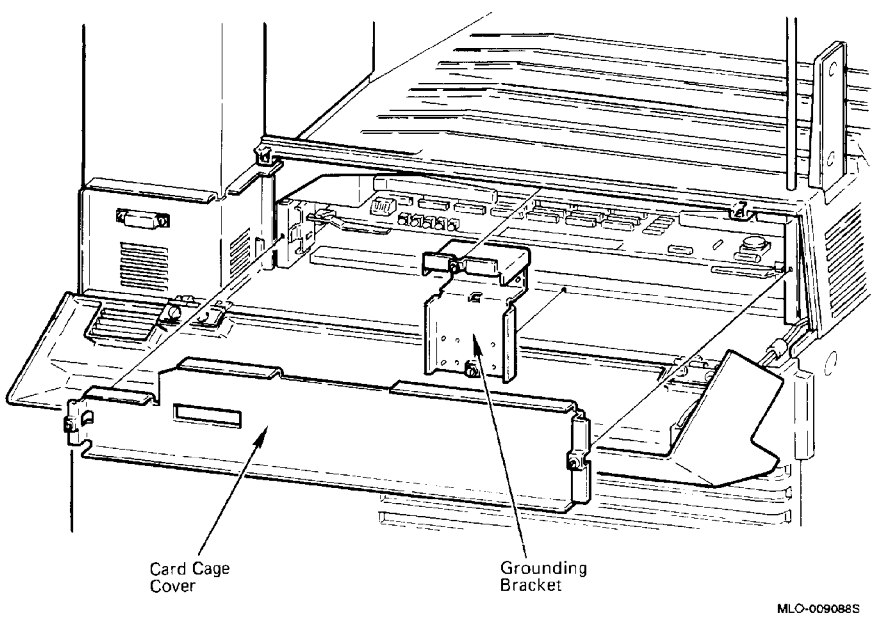


10.11 Engine Drive, Controller, and Memory Boards

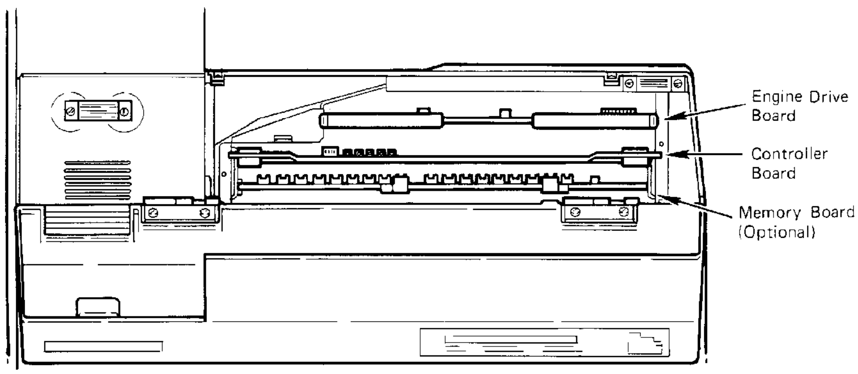
Remove the controller, optional memory (is present), and engine drive board as follows:

1. Open the operator panel cover.
2. Remove the card cage cover by loosening its two screws.
3. Remove the grounding bracket by loosening its two screws.
4. Remove the circuit board by pulling open the release handles on each side of the board.

   Adjustments: *After replacing this component, perform the adjustments specified in Table 12–2.*



10.11 Engine Drive, Controller, and Memory Boards



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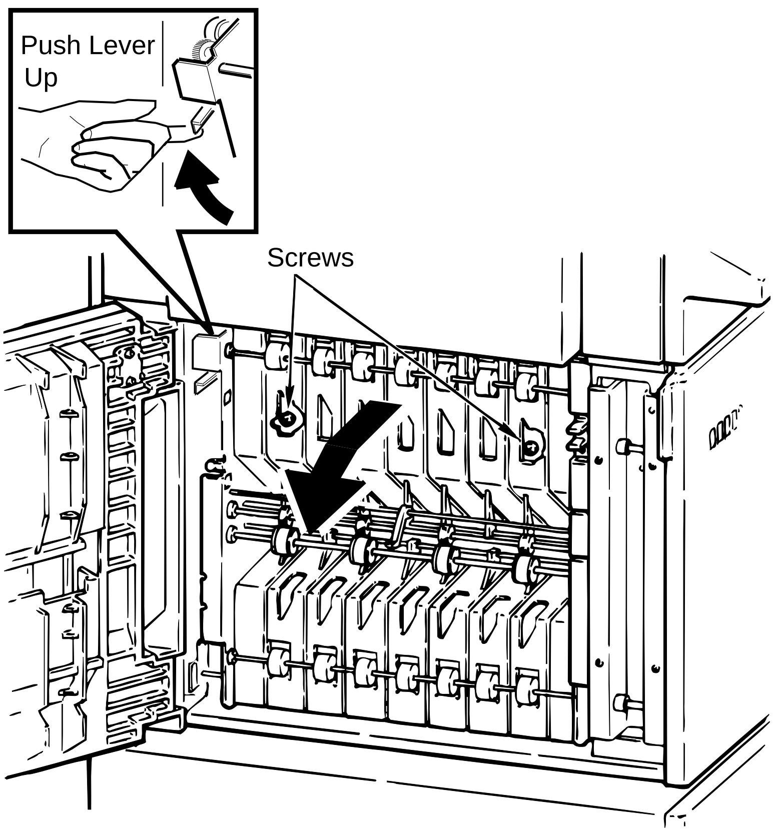
10.12 Fork Gate Unit

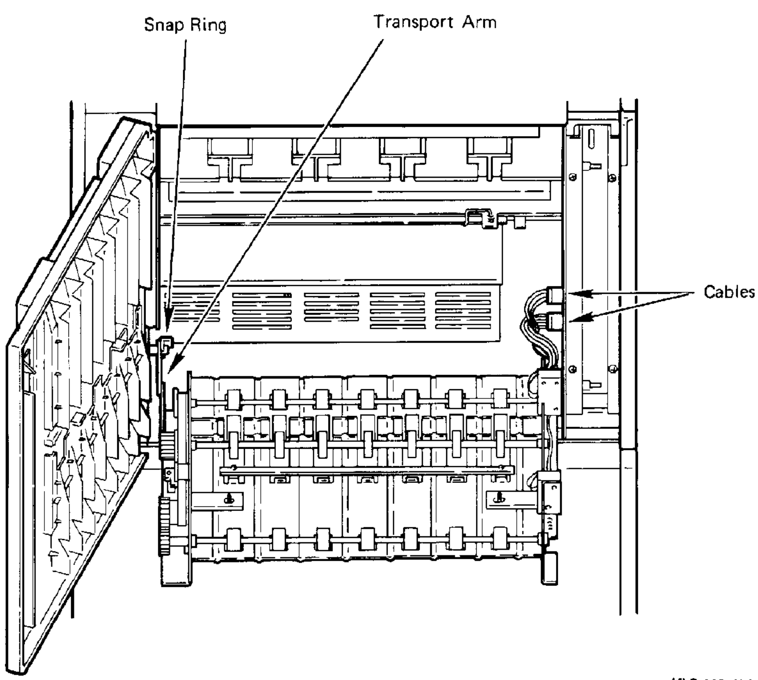
Remove the fork gate unit as follows:

1. Open the left side door and loosen the two exit transport screws.



2. Lower the fork gate unit and disconnect its two cables (one 6-pin and one 7-pin) from the print engine.
3. Remove the snap-ring from the stand-off on the left side of the print engine.
4. Slide the transport arm off the stand-off to remove the transport unit.

   Adjustments: *After replacing this component, perform the adjustments specified in Table 12–2.*



10.13 Fuser Connector or Interlock Switch

Use the following procedure to remove the connector bracket or interlock switch from the PrintServer 32:

Warning: *The fusing unit and anything connected to it might be hot to the touch.*

1. Power down and unplug the line cord.
2. Remove the rear cover, as shown in (Section 10.26).
3. Disconnect the 2-pin plug from CN1 on the low-voltage power supply assembly.
4. Unplug the 3-pin connector chassis mounted connector.
5. Remove the three screws that hold the connector bracket to the printer.
6. Remove the bracket.

Figure 10–2 New art

bracket exploding off. Show 2 connectors. Show 3 screws.

7. Remove the two screws and remove the interlock switch lever.
8. Unplug the four connectors from the interlock switch.
9. Pinch the two clips and remove the interlock switch from the bracket.

Figure 10–3 New art

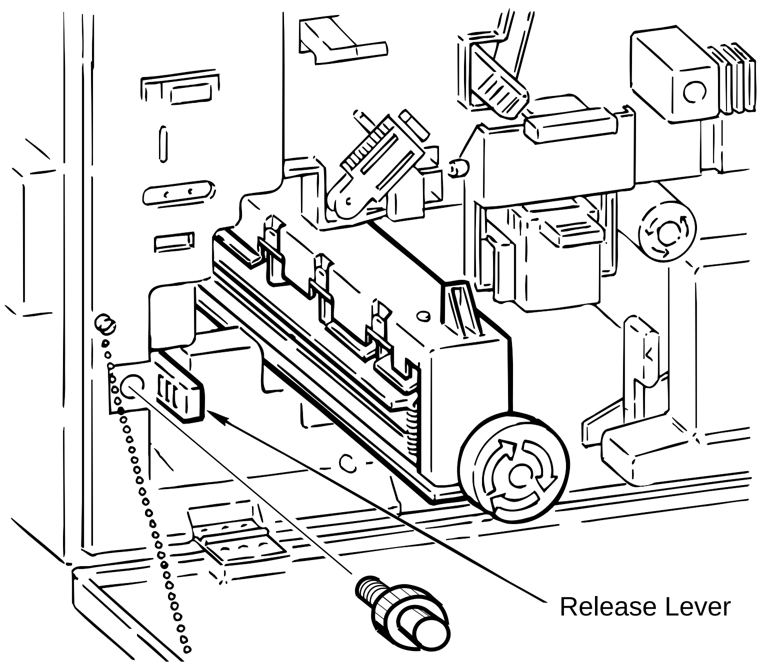
Show bracket with lever exploding off. Show two screws. Show 4 connectors. Show 2 clips.

10.14 Fusing Unit

Remove the fusing unit as follows:

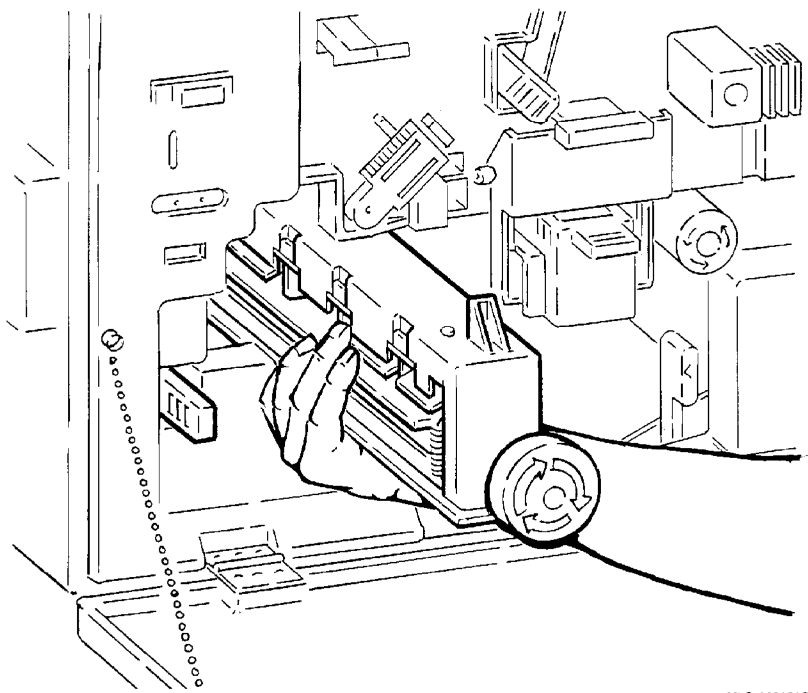
Warning: *The fusing unit may be hot. Be sure printer has been turned off and has had sufficient time to cool down before handling the fusing unit.*

1. Open the front cover.
2. Unscrew the release lever lock and remove it.
3. Push the fusing unit release lever to the left and pull the fusing unit out to the first stop.



4. While supporting the fusing unit with your hand, push the release lever to the left once again and pull the fusing unit out of the printer.
5. If you install a new fusing unit, the faulty unit must be specially marked and packaged, as shown in Section 10.14.1.

   Adjustments: *After replacing this component, perform the adjustments specified in Table 12–2.*



10.14 Fusing Unit

10.14.1 Special Fusing Unit Packaging Instructions

The repair vendor will not reimburse Digital Equipment Corporation for the warranty repair unless the maintenance 1 counter number is written on the label of the defective fusing unit.

When returning a defective fusing unit, make sure to record the current maintenance 1 counter number in the removal block of the defective unit and in the installation block of the new unit.

See Section 12.3 for information about reading the maintenance counter.

Figure 10–4 Fusing Unit Label

	COUNTER NO		COUNTER NO
INSTALLATION		REMOVAL	

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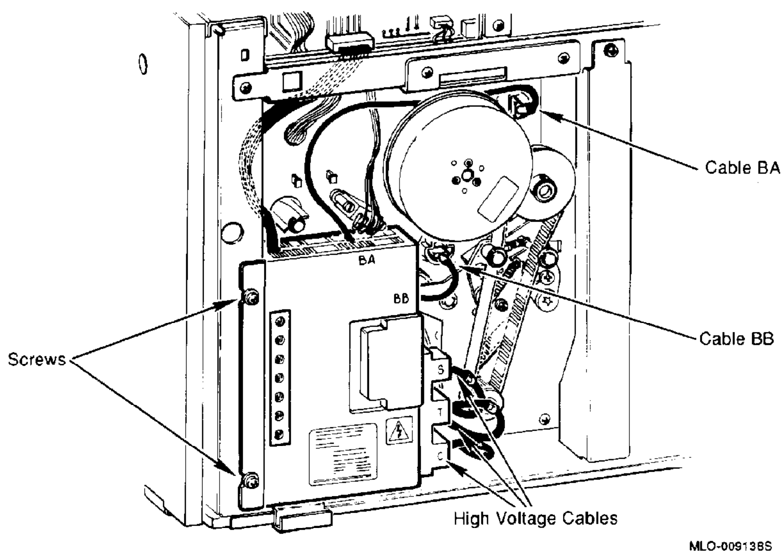
10.15 High-Voltage Power Supply

Remove the high-voltage power supply as follows:

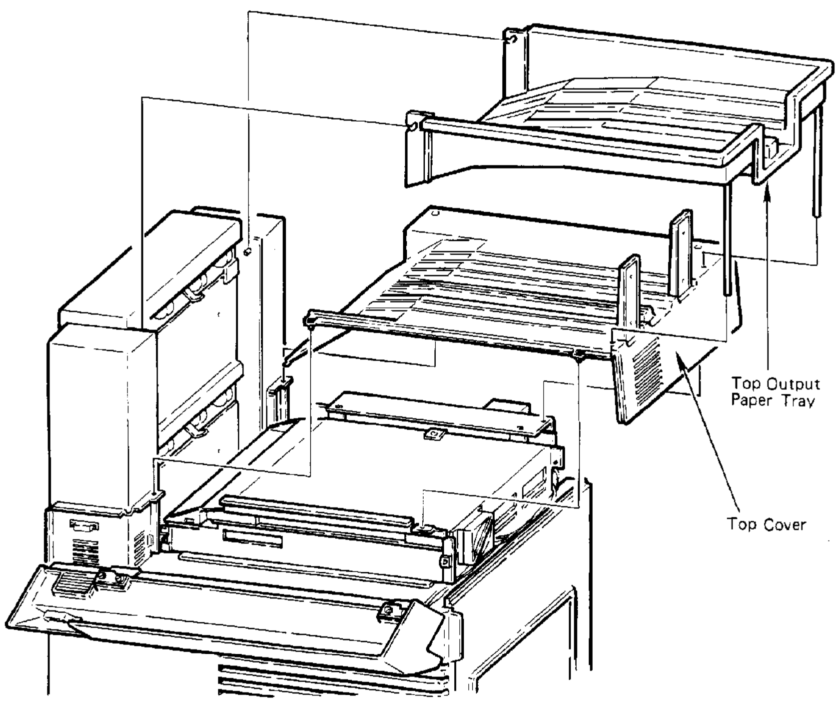
1. Remove the rear cover (Section 10.26).
2. Disconnect the three high-voltage cables (S, T, and C) from the power supply.
3. Disconnect the power supply cable (CN106) from the mother board and remove the cable from the wiring harness retainer.
4. Disconnect cable BA from the printer and remove the cable from its wiring harness retainers.
5. Disconnect cable BB from the printer.
6. Remove the power supply by loosening its two screws. *Check removal and replacement of the bracket.*



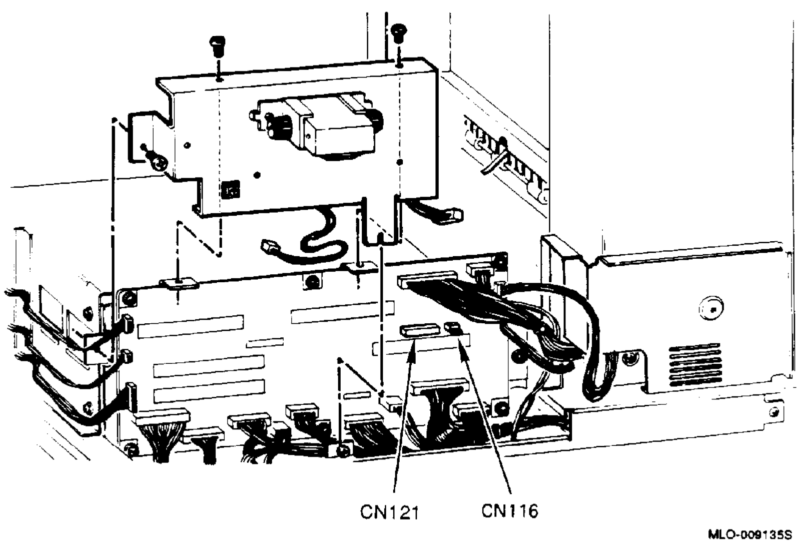
10.16 Interface Panel or Mother Board

Remove the mother board as follows:

1. Remove all the circuit boards from the card cage (Section 10.11).
2. Remove the rear cover (Section 10.26).
3. Remove the top output paper tray.
4. Remove the top cover by loosening its four screws.



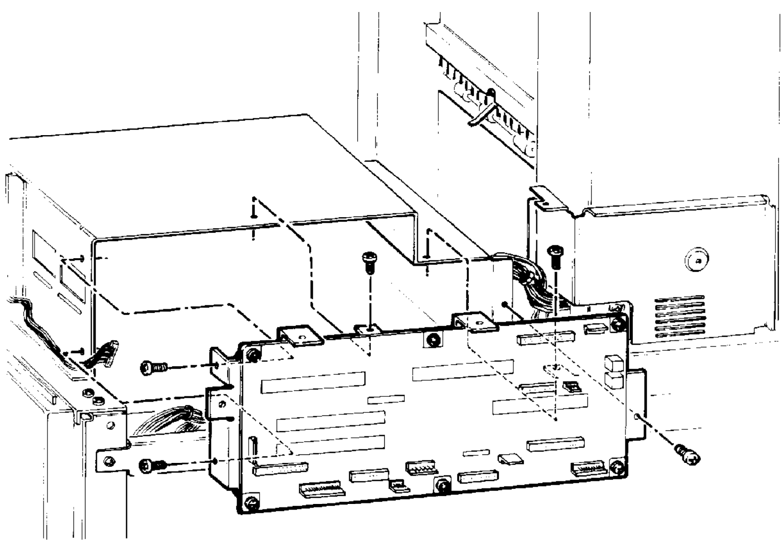
5. Disconnect the two interface bracket cables (CN116 and CN121) from the mother board.
6. Loosen the screw that holds the bracket to the printer.
7. Remove the three screws that hold the interface bracket to the printer
8. Lift and remove the interface bracket.



9. Disconnect the remaining cables from the mother board.

   Caution: *Be sure to carefully disconnect the two optical cables by their plugs and not by their cables. Disconnecting them by pulling on their cables can result in damage to the optic wire.*

10. Remove the mother board (with its bracket) by removing its five screws.



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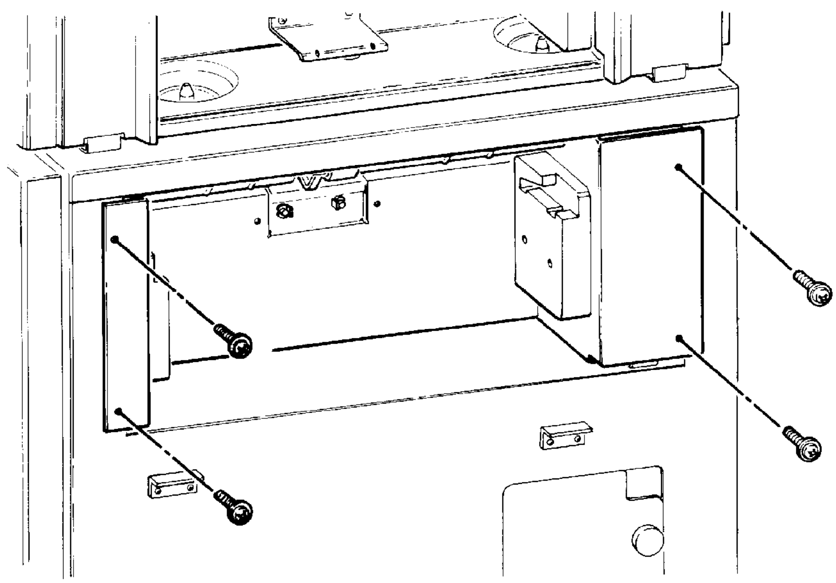
10.17 LCIT Feed Unit

Remove the LCIT feed unit as follows:

1. Remove the LCIT (Section 10.18).
2. Remove the four feed unit screws.



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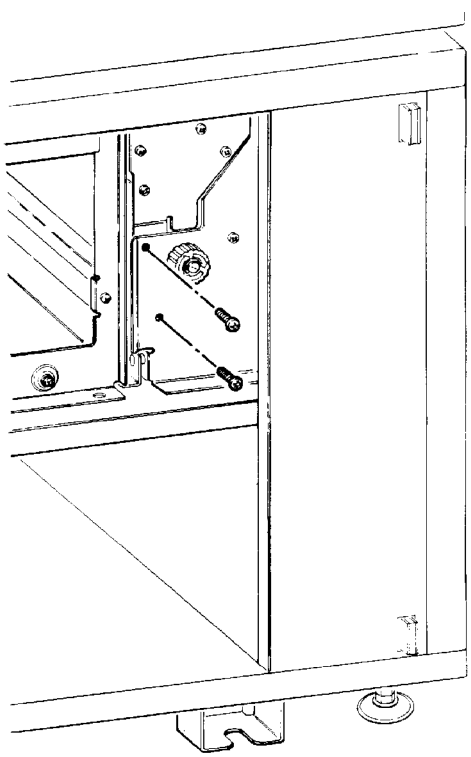
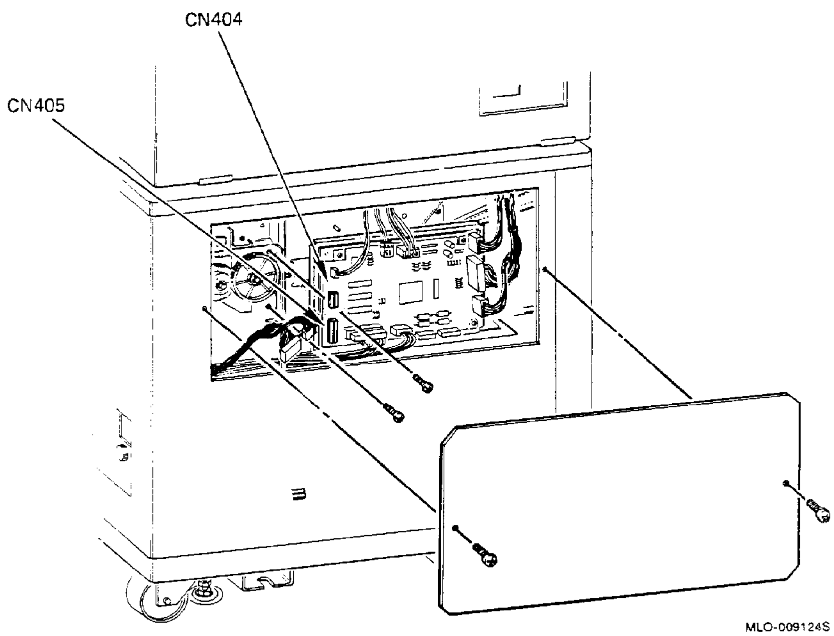
10.17 LCIT Feed Unit

3. Open the cabinet door and remove the two feed unit screws.



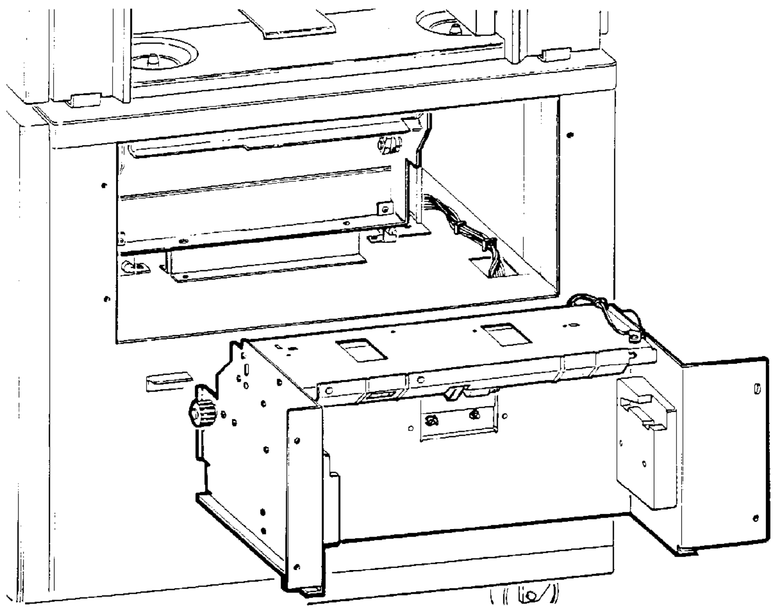
4. Remove the rear cabinet cover by removing its two screws.
5. Remove the two feed unit screws.
6. Unplug the 10-pin CN405 and 5-pin CN404 connectors from the from the duplexer/LCIT drive board.
7. Remove the cables from the wiring harness retainer.



10.17 LCIT Feed Unit

8. Slide the feed unit out of the printer.

   Adjustments: *After replacing this component, perform the adjustments specified in Table 12–2.*

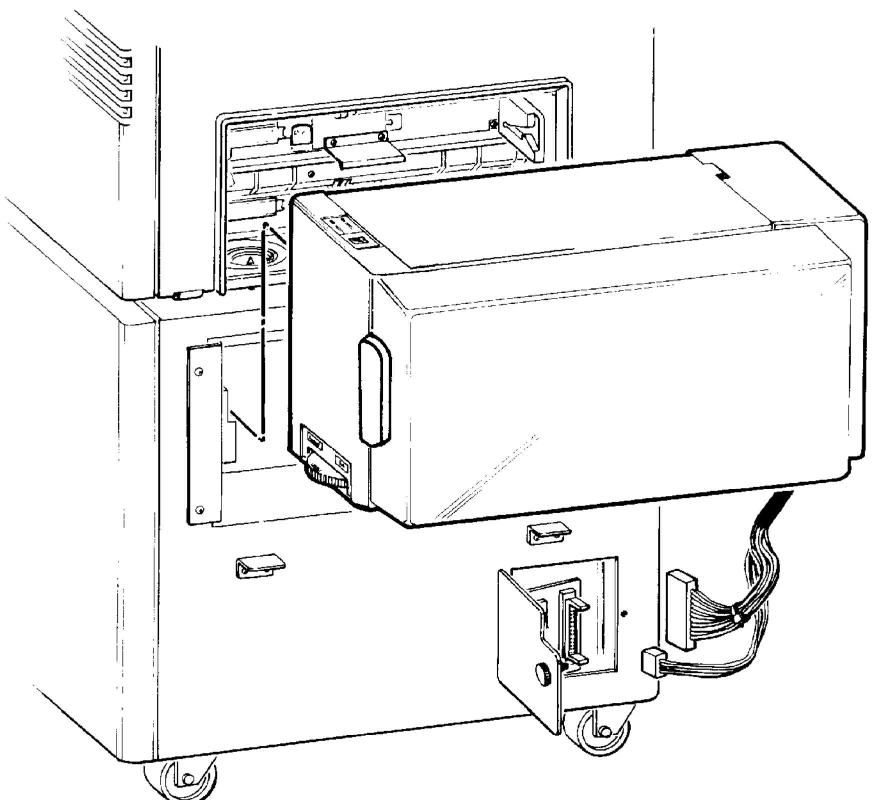


10.18 Large Capacity Input Tray (LCIT)

Remove any paper in the LCIT and remove the tray as follows:

1. Remove the top and bottom paper cassettes.
2. Open the small cable door on the cabinet below the LCIT and disconnect the large and small cables.
3. Lift the LCIT up slightly and slide it out from the printer.
4. See Section 10.18.1 for special LCIT packageing-for-shiping instructions.

   Adjustments: *After replacing this component, perform the adjustments specified in Table 12–2.*



10.18 Large Capacity Input Tray (LCIT)

10.18.1 Special LCIT Packaging Instruction

When packaging a defective LCIT for return, make sure to include a complete set of baseplates. The vendor will not reimburse Digital Equipment Corporation for a defective LCIT unless the following complete set of base plates is returned in the same package as the LCIT.

Table 10–1 LCIT Baseplates

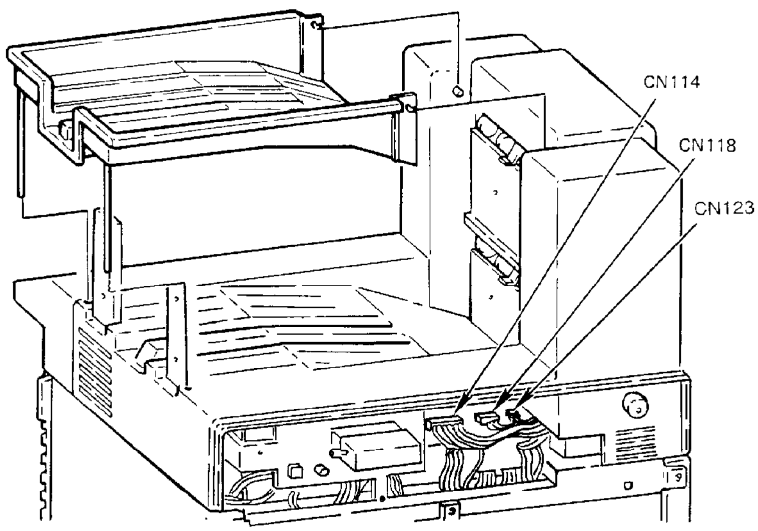
	Size	
	Inches	**Millimeters**
A4	11.7 x 8.3	297 x 210
LT	11.0 x 8.5	280 x 216
A4R	8.3 x 11.7	210 x 297
A5R	5.8 x 8.3	148 x 210
B4R/B5	10.1 x 14.4–7.2	257 x 364–182
B5R	7.2 x 10.1	182 x 257

10.19 Large Capacity Output Tray (LCOT)

Remove the LCOT as follows:

1. Remove the top output paper tray.
2. Remove the rear cover (Section 10.26).
3. Unplug the following connectors from the mother board:
   - 40-pin CN114
   - 4-pin CN123
   - 5-pin CN118
4. Open the LCOT side door.
5. Loosen the four captive screws.
6. Grasp the LCOT securely and slide in backwards to disengage the latch that holds the front of the LCOT to the print engine.
7. Remove the LCOT.

10.19 Large Capacity Output Tray (LCOT)



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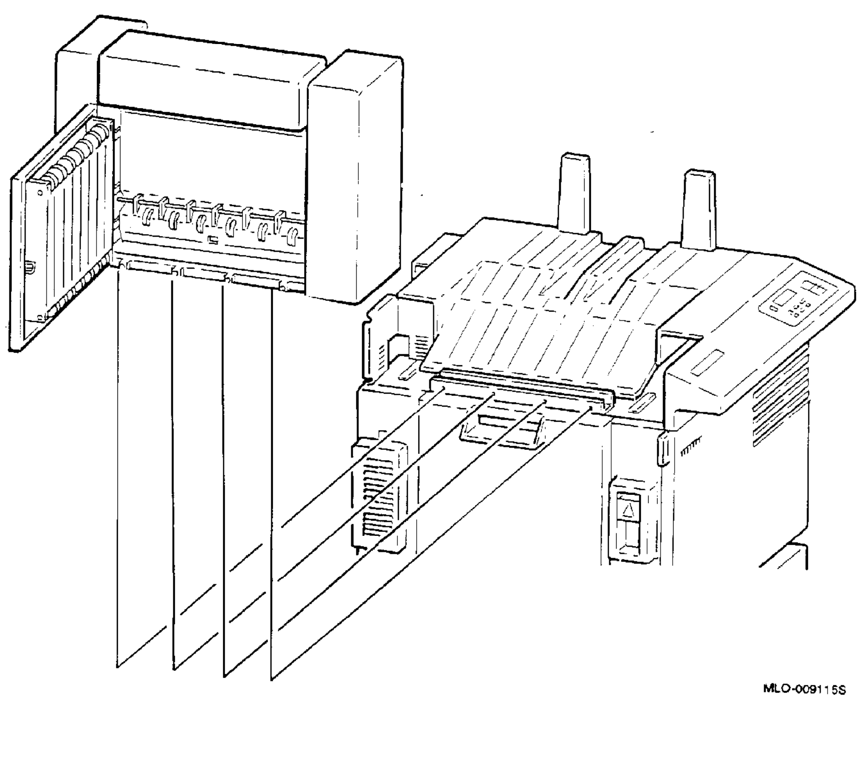

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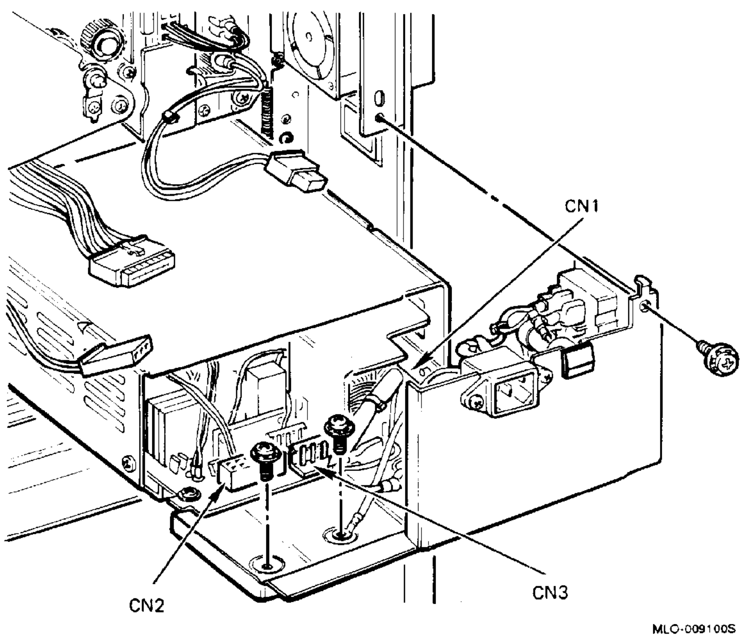
10.20 Low-Voltage Power Supply

Remove the low-voltage power supply as follows:

1. Remove the rear cover (Section 10.26).
2. Remove the three screws that hold the power supply to the printer.

   Warning: *When replacing the power supply, be sure to secure the grounding wire to the chassis by using one of the grounding type screws.*
3. Unplug the 16-pin cable, CN2, and 3-pin cable, CN3, connectors from the power supply.
4. Pull the power supply out a few inches and disconnect the 2-pin cable (CN1) from the power supply.
5. Remove the power supply by pulling it straight out of the printer.



10.21 Main Drive Unit and OPC Drive Belt

Remove the main drive unit and belt as follows:

Caution: *registration clutch note*

1. Remove the rear cover (Section 10.26).
2. Loosen the Allen screw on the pulley.
3. Remove the pulley, timing belt, and bearing from the engine by sliding them off their shafts.

TO BE DONE

4. Loosen the idler arm screw.

   Reassemble Step: Dynamically adjust the main timing belt tension.

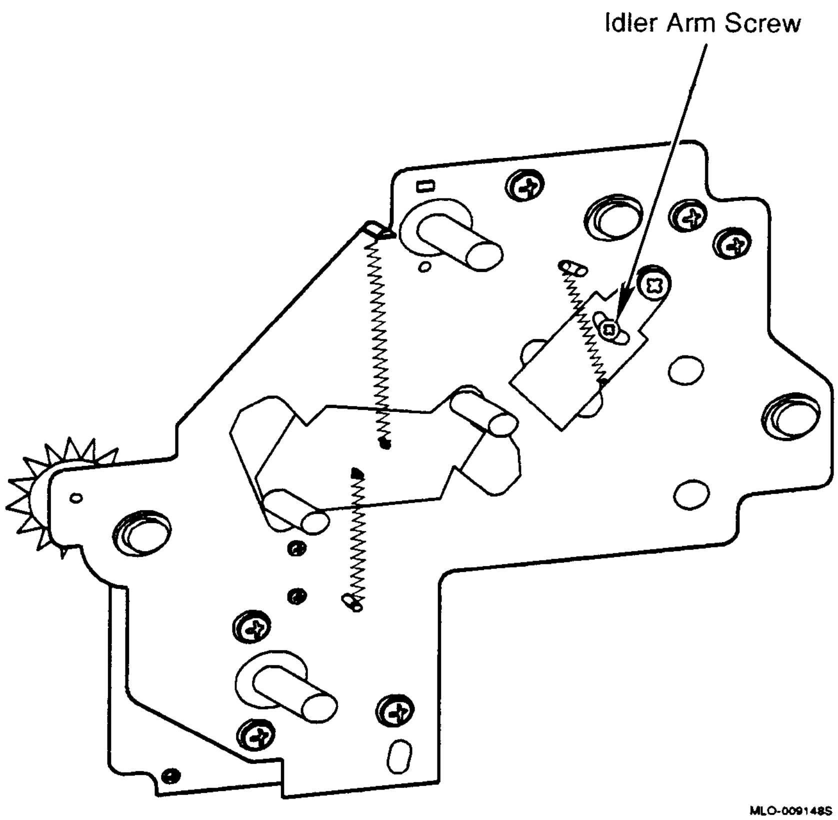
   a. Turn on the printer power and loosen the idler arm screw.

   b. After warm-up, when the main motor runs, you will see the main timing belt tighten up.

   c. Tighten the idler arm screw.

5. Remove the four screws from the main drive unit.

6. Remove the main drive unit by pulling it out while pushing down on the idler arm to relieve tension on the drive belt.

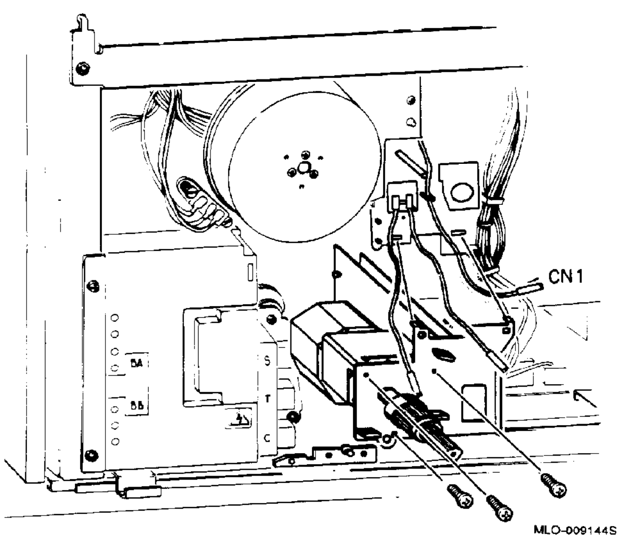


10.22 Main Motor

Check removal and replacement of the bracket.

Replace the main motor as follows:

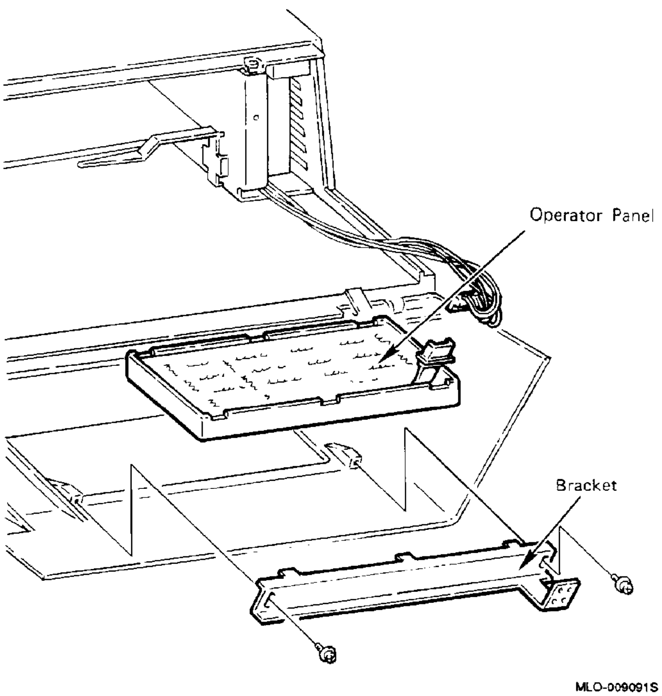
1. Remove the main drive unit (Section 10.21).
2. Unplug the 4-pin connector that connects the main motor circuit board to the cable harness.
3. Gently remove the high-voltage power supply cables from their retainers on the motor bracket and the engine chassis.
4. Remove the three screws that hold the bracket to the printer.
5. Remove the main motor unit.



10.23 Operator Panel

Remove the operator panel as follows:

1. Open the operator panel cover.
2. Disconnect the operator panel cable.
3. Remove the bracket by removing its two screws.
4. Lift out the operator panel.

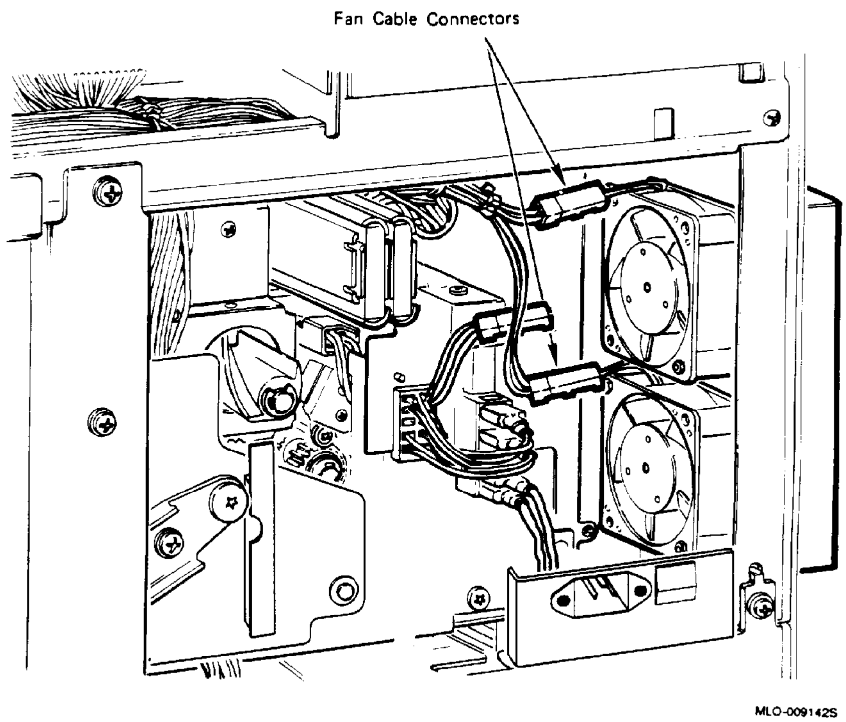


10.24 Ozone Filter Fans

Remove the ozone filter fans as follows:

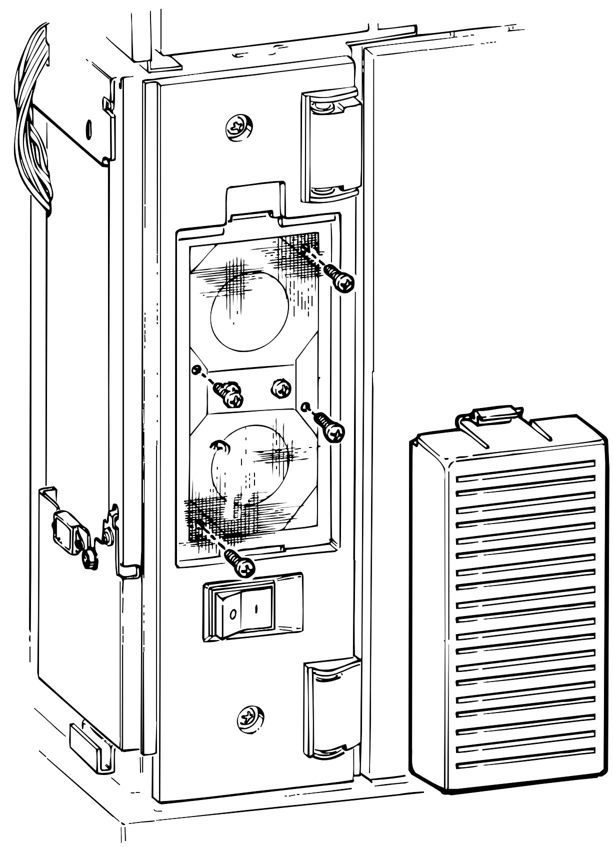
Note: *This procedure explains how to remove both ozone fans. When troubleshooting, you may only have to replace one of the fans.*

1. Remove the rear cover (Section 10.26).
2. Disconnect the two fan cables.



10.24 Ozone Filter Fans

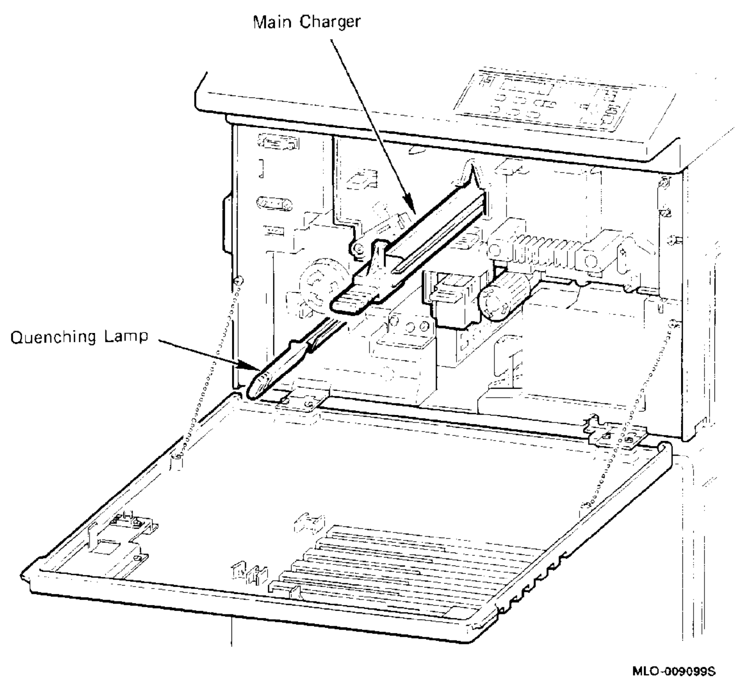
3. Remove the ozone filter cartridge.
4. Remove the fans by removing their four screws and nuts.



10.25 Quench Lamp, Main Charger, or Main Fan

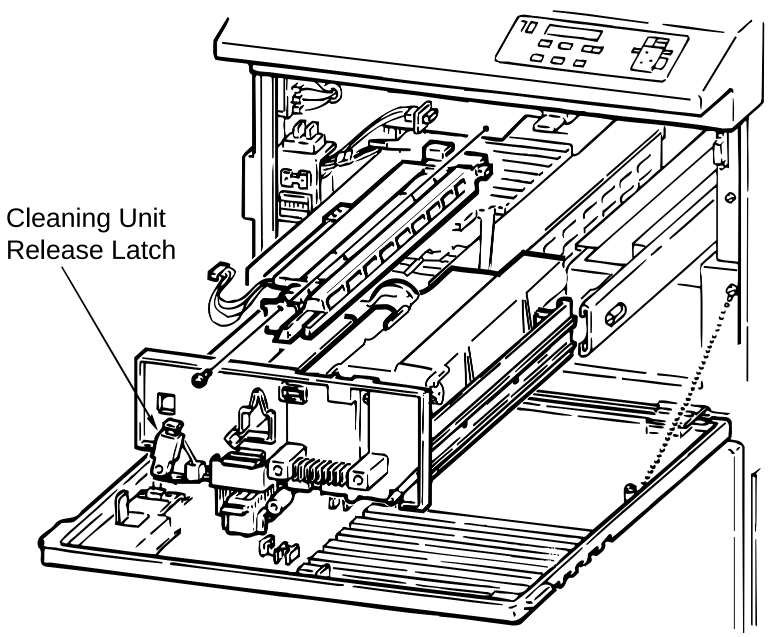
Remove the main fan as follows:

1. Pull and remove the main charger.
2. Pull and remove the quenching lamp.



10.25 Quench Lamp, Main Charger, or Main Fan

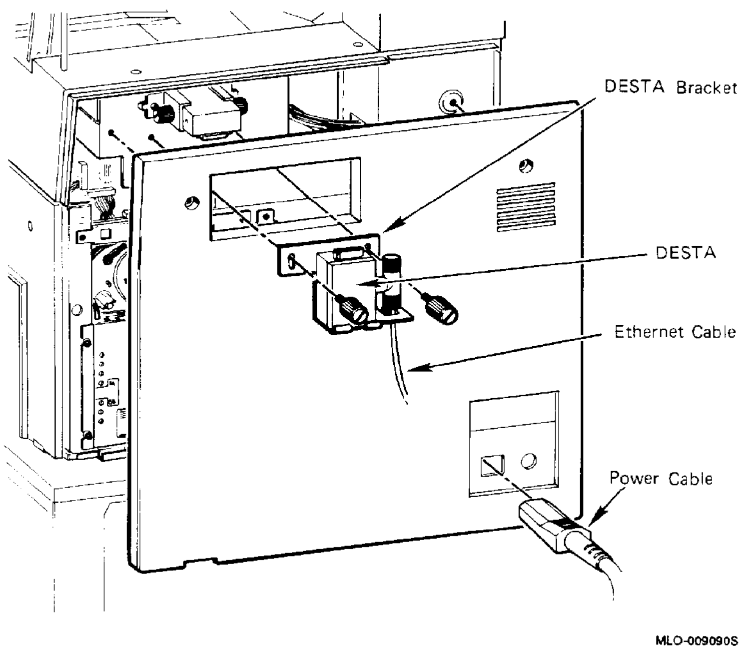
3. Depress the cleaning unit release latch.
4. Remove the cleaning unit.
5. Unplug the 2-pin connector from the cable harness.
6. Remove the screw that holds the fan bracket to the printer.
7. Pull and remove the main fan.



10.26 Rear Cover

Remove the rear cover as follows:

1. Disconnect the power cable.
2. Disconnect the Ethernet cable.
3. Remove the DESTA (if present).
4. Remove the DESTA bracket.
5. Remove the rear cover by loosening its two screws.



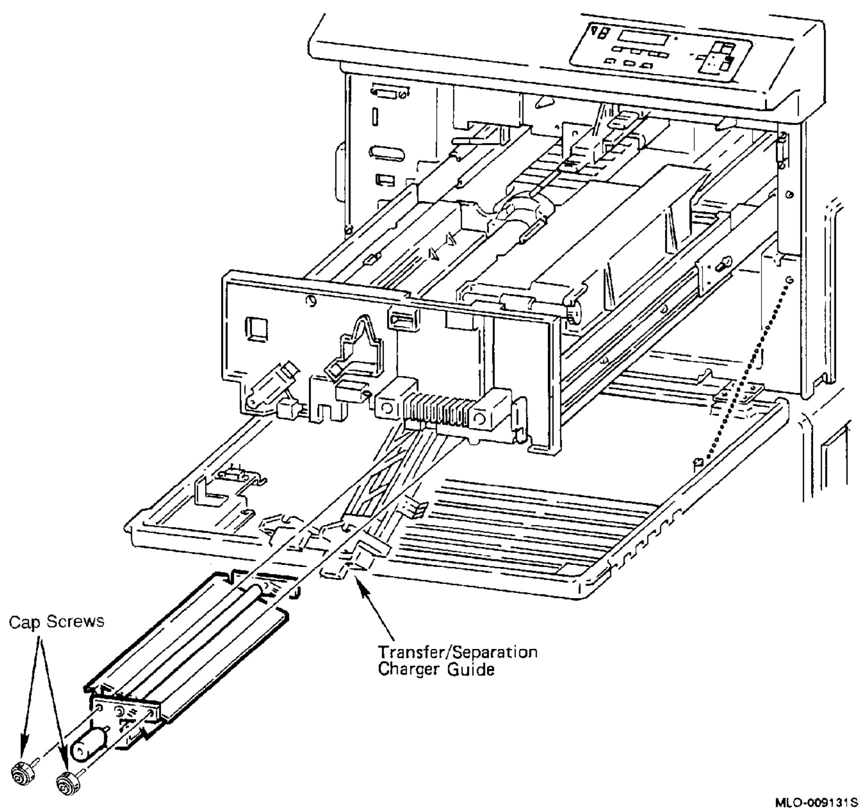
10.27 Registration Roller Unit

Remove the registration roller unit as follows:

1. Open the front cover and the development drawer.
2. Lower the transfer/separation charger guide.
3. Remove the two cap-screws and remove the registration roller unit.

   Adjustments: *After replacing this component, perform the adjustments specified in Table 12–2.*

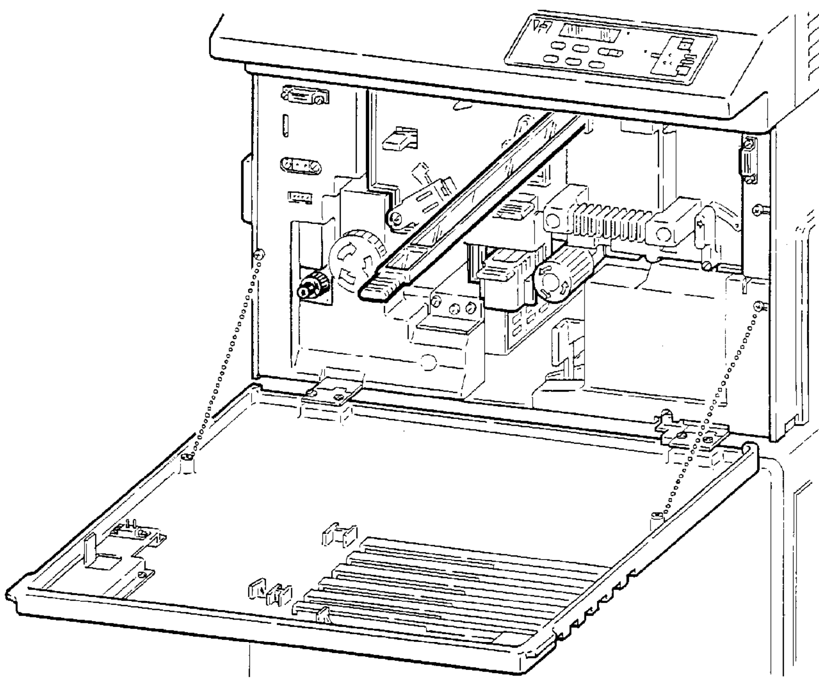
   Caution: *When handling the registration roller unit, take care to not damage or bend the mylar strips.*



10.28 Shield Glass or Optical Unit

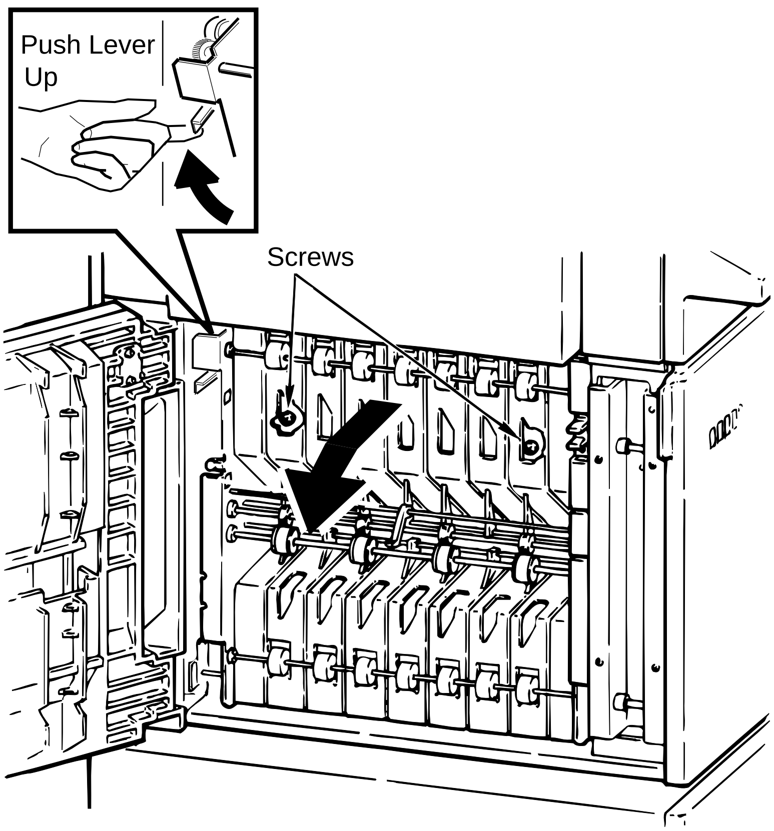
Remove the optical unit as follows:

1. Open the front cover and remove the shield glass.



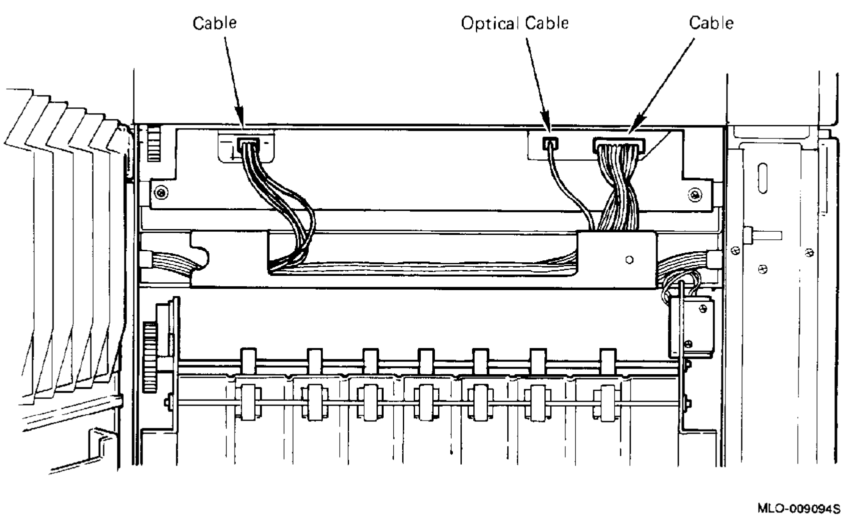
10.28 Shield Glass or Optical Unit

2. Open the lower left side door and loosen the two fork gate unit screws.



3. Lower the fork gate unit and disconnect the three cables from the optical unit.

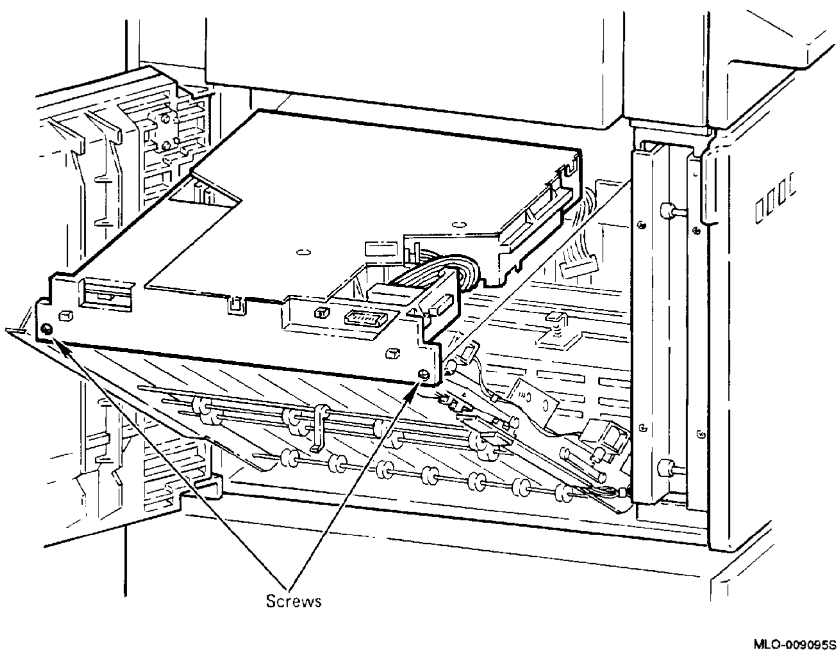
   Caution: *Be sure to carefully disconnect the optical cable by its plug and not by its cable. Disconnecting it by pulling on the cable can result in damage to the optic wire.*



10.28 Shield Glass or Optical Unit

4. Remove the optical unit from the printer by loosening its two screws and sliding the unit out.

   Adjustments: *After replacing this component, perform the adjustments specified in Table 12–2.*



10.29 Total Counter Unit

Use the following procedure to remove and replace the totals counter unit from the PrintServer 32:

1. Remove the fusing unit, as shown in Section 10.14.
2. Open the development draw. Protect the OPC drum.
3. Remove the three screws that hold the total panel to the printer.
4. Remove the panel.
5. Remove the screw that holds the bracket to the printer.
6. Unplug the three connectors and remove the totals counter.

Figure 10–5 New art

Show cover exploding off. Show 3-screws and 3-connectors.

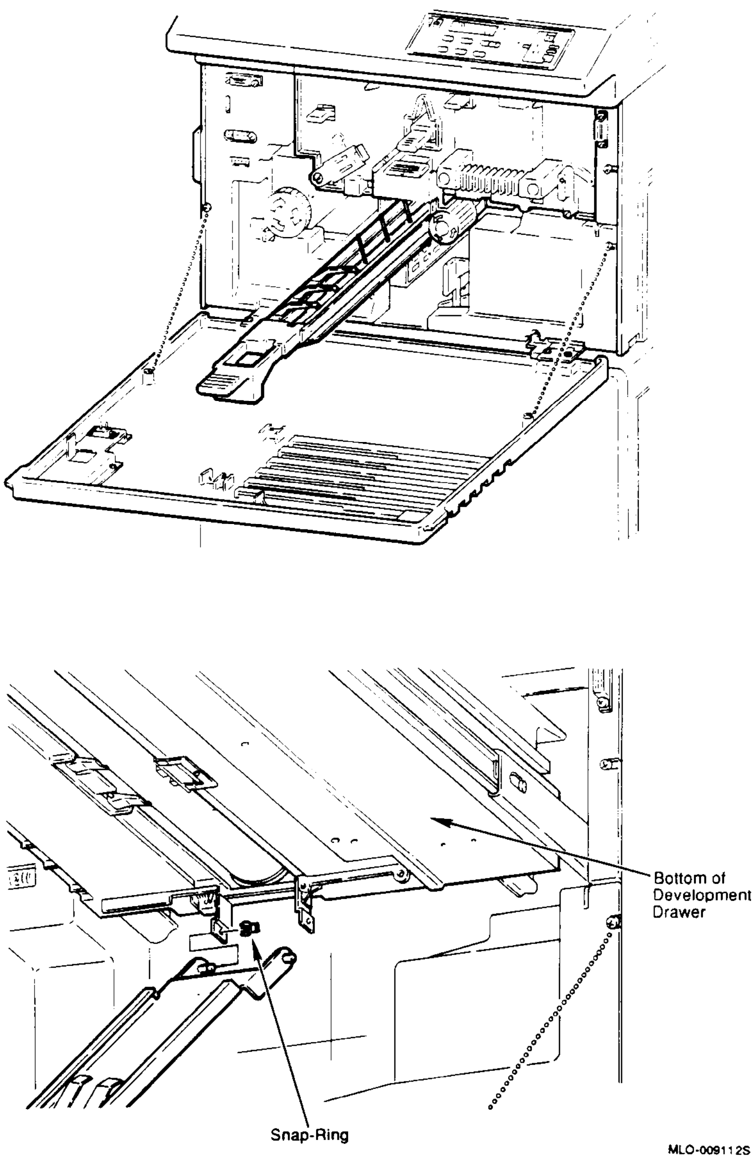
10.30 Transfer/separation Charger and Bracket

Use the following procedure to remove and replace the transfer/separation charger and the bracket that attached development draw.

Caution: *To avoid bending paper guides or ground clips, carefully follow the sequence of parts removal presented in the following procedure.*

1. Open the front cover.
2. Remove the transfer/separation charger. When replacing the charger, make sure it is installed correctly in the guides.
3. Remove the plastic snap-ring at the rear (left side) of the charger guide.
4. Move the charger guide to the left to remove it from the rear bracket.

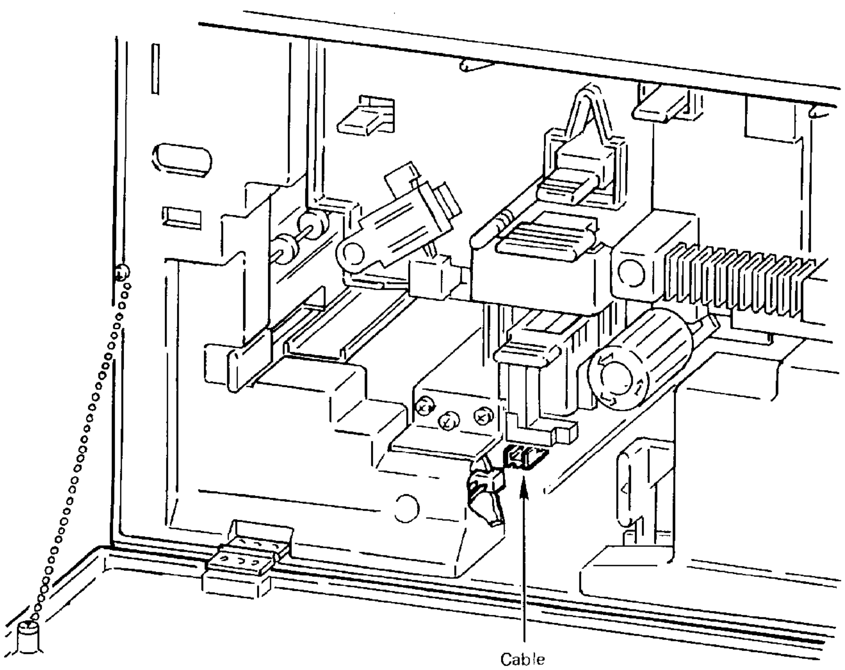
10.30 Transfer/separation Charger and Bracket



10.31 Transport Unit

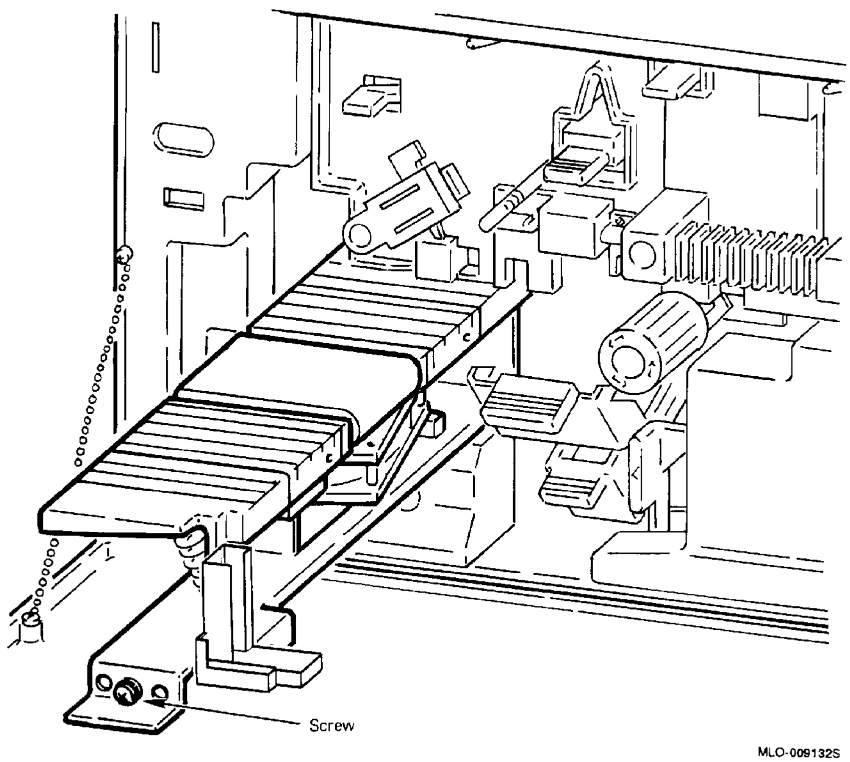
Remove the transport unit as follows:

1. Remove the fusing unit (Section 10.14).
2. Disconnect the transport unit cable from the print engine.



3. Lower the transfer/separation charger guide.
4. Loosen the captive screw that holds the transport to the print engine.
5. Pull and slide the transport unit to disconnect the latch and remove it.

   Adjustments: *After replacing this component, perform the adjustments specified in Table 12–2.*



11

Scheduled Maintenance

This chapter explains the PrintServer 32 maintenance procedure. When one of the following messages is displayed, the customer should call to arrange a maintenance call.

Call Customer Services maintenance 1 required

This display appears when the maintenance 1 counter count reaches 320,000[1] (320k). Perform the following procedures:

1. Section 11.1
2. Section 11.2
3. Section 11.3

Call Customer Services maintenance 2 required

This display appears when the maintenance 2 counter count reaches 2,400,000[1] (2400K). Perform the three 320K procedures listed above and also perform Section 11.4.

[1]The maintenance counter numbers number might not correlate with the number on the totals counter which is located behind the front door of the print engine.

Note: *Do the following after completing the 320k or 2400k maintenance:*

- *Reset the maintenance counters, as shown in Chapter 4. If the maintenance counter fails to clear, goto Section 7.41.*
- *Record the maintenance counter numbers in the PrintServer 32 Maintenance Log. See Chapter 12 for more about counters and sub-counters.*

11.1 Maintenance 1 Cleaning the Development Drawer

Use the following procedures to clean the development drawer:

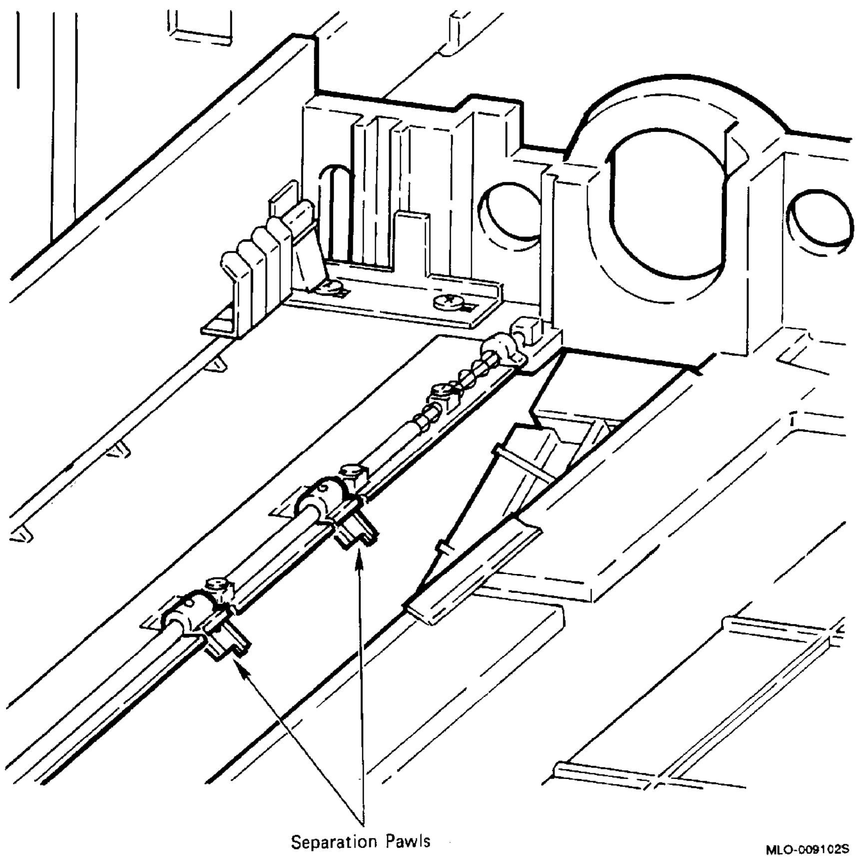
1. **Remove the development drawer components.**.
   a. The cleaning and development units , as shown in Section 10.6.
      → Discard the development unit.
   b. The registration roller unit, as shown in Section 10.27.
   c. The OPC drum, as shown in Section 10.6.

      Caution: *Fingerprints and prolonged exposure to room light can damage the print drum. The damage causes image defects or reduced life span. Handle the drum carefully by its ends. Place the drum in a light proof enclosure or cover with paper.*
2. **Clean the development drawer components.**
   a. Vacuum the inside of the development drawer thoroughly.
   b. Figure 11–1 shows the OPC drum separation pawls. Clean the pawls with a clean damp cloth.

      Caution: *The separation pawls are very sharp; be careful when cleaning them.*

11.1 Maintenance 1 Cleaning the Development Drawer

Figure 11–1 Cleaning the Separation Pawls



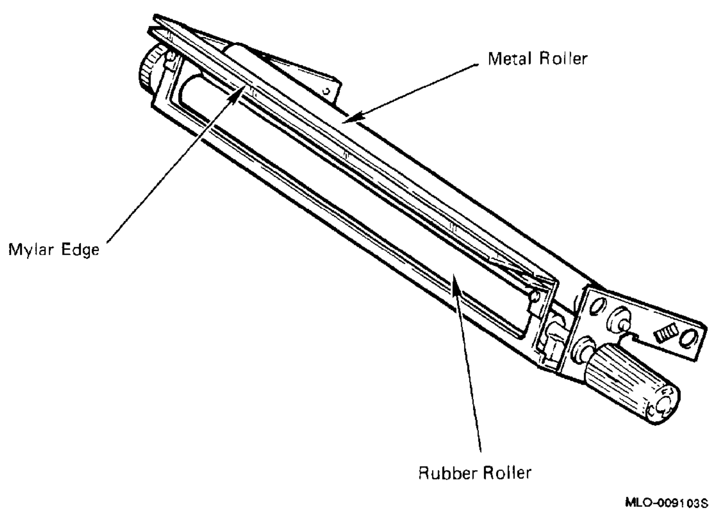
c. Vacuum the rubber and metal rollers on the registration roller unit while turning the roller knob. See Figure 11–2.

d. Clean both rollers and the mylar edge with a clean damp cloth until no toner remains.

3. Install a new development unit.
4. Replace the cleaning unit.
5. Replace the OPC drum.
6. Add toner to the development unit.
7. Close the development drawer.

Caution: *The mylar edge is eaisly damaged. If you see any nicks or bends in the mylar edge, replace the registration roller unit.*

Figure 11–2 Cleaning the Registration Roller Unit



11.2 Maintenance 1 Cleaning the Transport Unit

Use the following procedure to clean the transport unit:

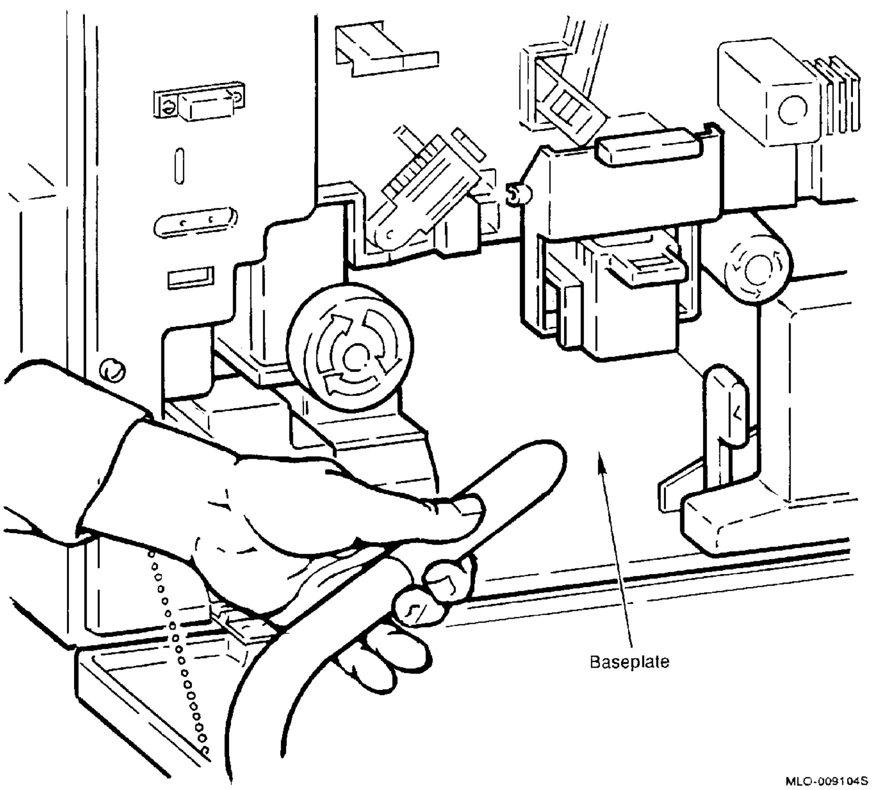
Warning: *The fusing unit may be hot.*

1. Remove the fusing unit as shown in Section 10.14.

   → Discard the fusing unit.

2. Remove the transport unit, as shown in Section 10.31.
3. Vacuum any toner remaining on the engine base plate.

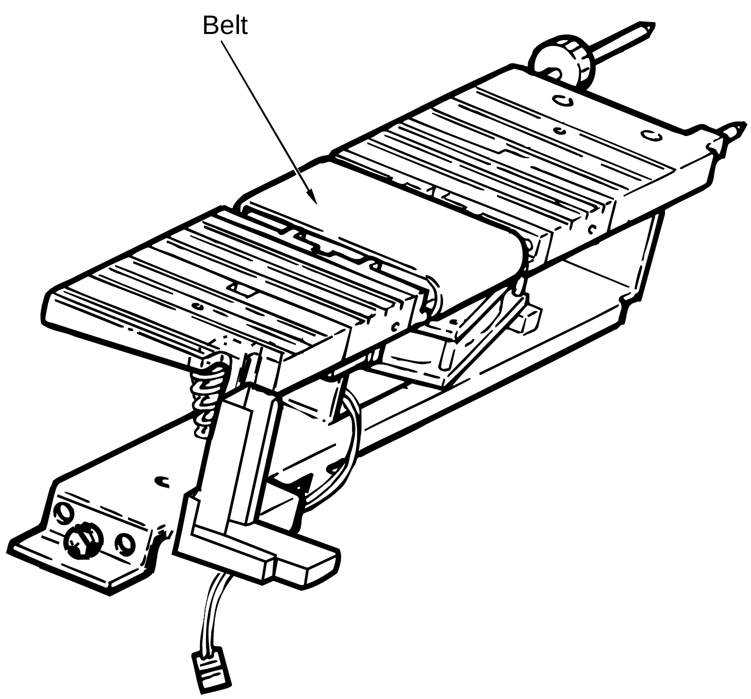
Figure 11–3 Vacuuming the Print Engine Area



11.2 Maintenance 1 Cleaning the Transport Unit

4. Vacuum the transport unit thoroughly while rotating the transport unit belt. (See Figure 11–4)
5. Clean all surfaces of the transport unit with a clean damp cloth.
6. Replace the transport unit.
7. Install a new fusing unit.
8. Close the front cover.

Figure 11–4 Cleaning the Transport Unit



11.3 Maintenance 1 Feed, Prefeed, and Separation Rollers

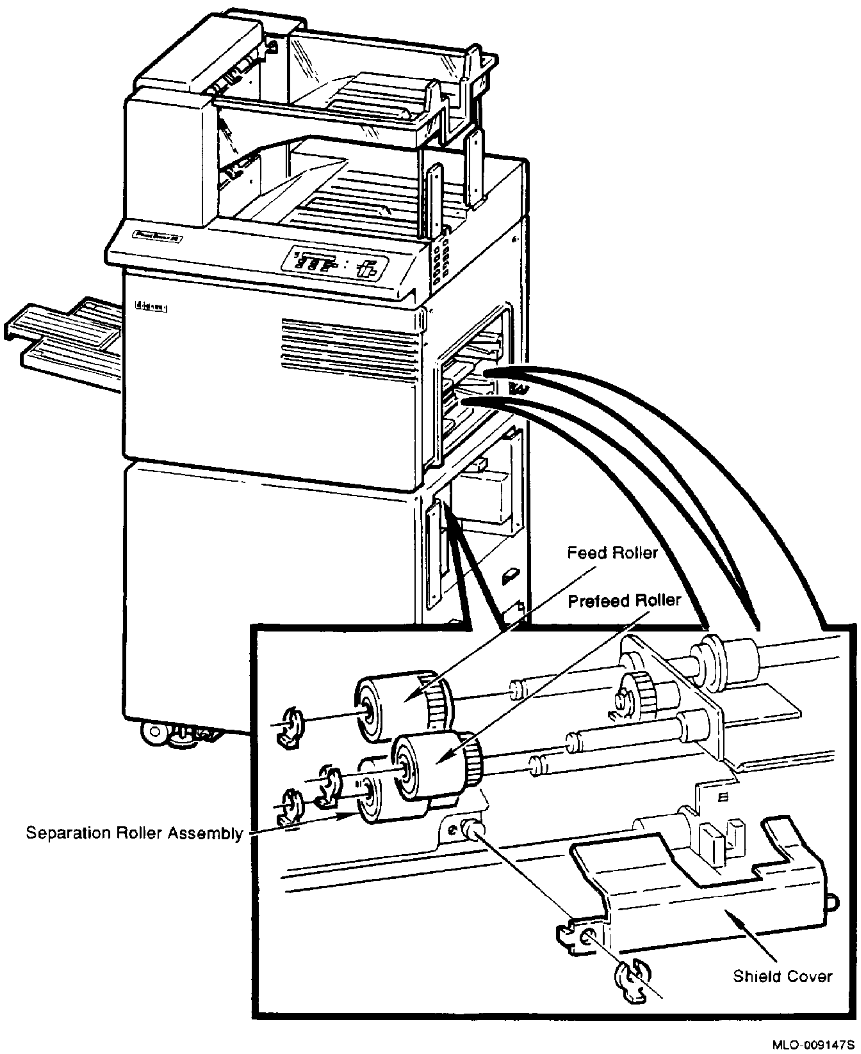
Use the following procedure to replace the feed, prefeed, and separation rollers for the LCIT and cassettes:

Caution: *Be sure to replace the rollers on one cassette at a time, as there are subtle differences in some parts of the upper and lower cassettes.*

1. Remove the top cassette tray.
2. Remove the lower cassette tray.
3. Remove the LCIT, as shown in Section 10.18
4. Use the following procedure to remove the three sets of paper feed rollers from the LCIT and from the upper and lower cassette:
   a. Remove the snap-ring from the shield cover and remove the cover.
   b. Remove the snap-ring from the prefeed roller and slide the roller off its shaft.
   c. Remove the snap-ring from the feed roller and slide the roller off its shaft.
   d. Remove the snap-ring from the separation roller assembly and slide the assembly off its shaft.
5. Replace the rollers with new parts. Be careful to not mix-up the cassette and LCIT rollers, or a high rate of paper jamming might occur.
6. Enter the field test mode (FTM), as shown in Chapter 4, and depresses the **2, 5, 6** keys.

11.3 Maintenance 1 Feed, Prefeed, and Separation Rollers

Figure 11–5 Replacing the Feed, Prefeed, and Separation Rollers



11.4 Maintenance 2 Required Procedure

When the following message is displayed, first perform the 320K maintenance procedures in Sections 11.1, 11.2, and 11.3:

Call Customer Services
maintenance 2 required

- Remove the main fan unit, as shown in Section 10.25.
- The registration roller unit, as shown in Section 10.27.

  → Discard the main fan and registration roller unit.
- Install a new main fan and registration roller unit.
- Enter FTM, as shown in Chapter 4 and depresses the **2, 5, 1, 6** keys.

12

Engine Board Menus and Adjustments

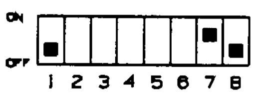
This chapter describes the PrintServer 32 features provided through the firmware that resides on the engine board. The engine drive menus are used to perform margin adjustments and to read the electronic counters. This chapter consists of the following sections:

- Section 12.1 describe how to bring up the engine drive board menus. Section 12.1.2 describes how to set parameters used for test printing.
- Section 12.2 explains how to read and decode the various error logs and messages.
- Section 12.4.3 describes the margins, tells how to measure the margins, and tells when to adjust the margins.
- Section 12.3 describes the various PrintServer 32 counters and describes how to call up and read the counters.

12.1 Bringing Up the Engine Board Menu

Use the following procedure to invoke the engine drive board menus:

1. Power down the printer.
2. Open the operator's panel cover and remove the card cage cover as shown in Section 10.11
3. Figure 12–2 shows the location of the 8-switch switchpack on the print engine drive board.
   - For normal operation all switches must be down or off.
   - Make sure switches **1** and **8** are always set to **off**.



Switch **7** enables the engine drive board firmware and disables the operation of the controller board.

4. Set switch 7 to the on or up position. The parameters can also set at this point, see Section 12.1.2
5. Power on the printer.
6. Figure 12–1 shows the message that appears appear on the LCD and shows the layout of the engine mode menu.
7. Turn to Sections Section 12.4 for measuring or adjusting margins or to Section 12.3 for reading the counters.

Figure 12–1 Engine Board Menu Prompt and Panel

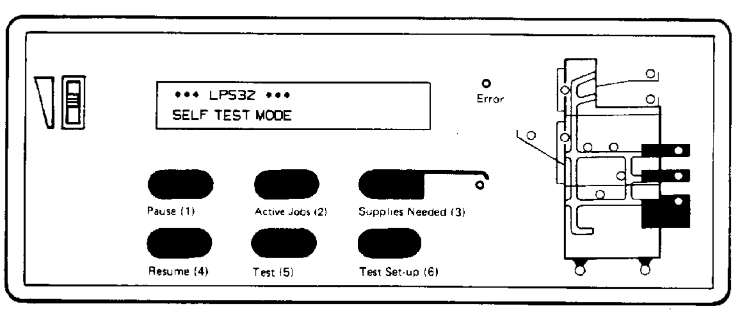


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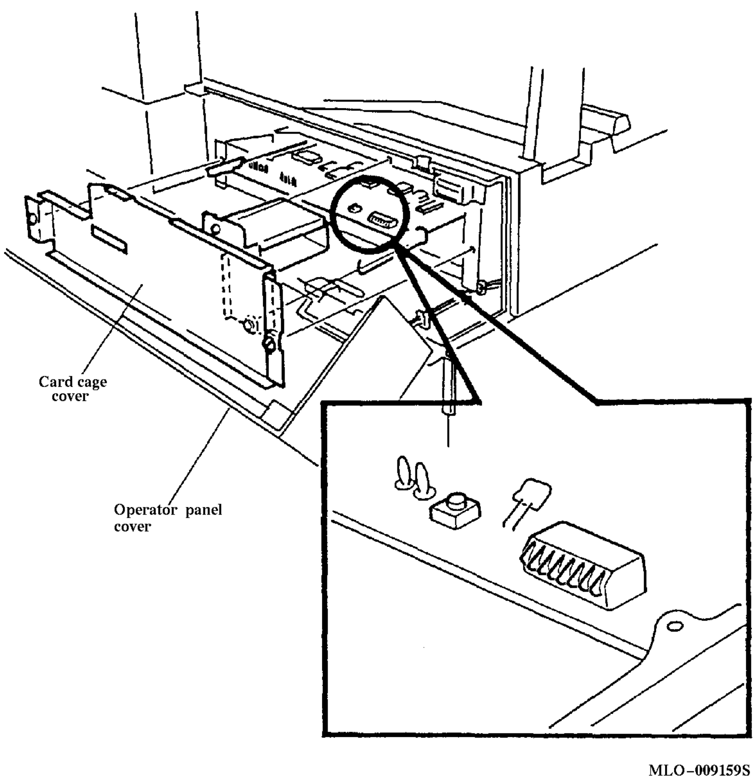
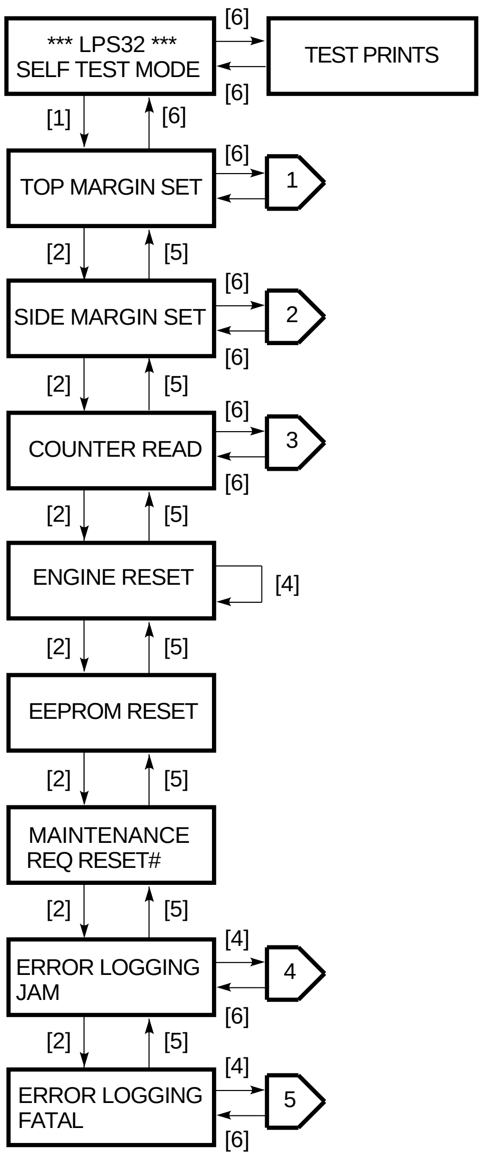
Figure 12–2 Engine Drive Board Switchpack



12.1 Bringing Up the Engine Board Menu

12.1.1 Operation of the Engine Drive Board Menu

12.1 Bringing Up the Engine Board Menu



The EEPROM RESET and MAINTENANCE REQ. RESET# menus are not discussed in this service guide and the use of these menus is not recommended for the field.

The exit diamonds refer to the following sections:

- Turn to Section 12.4 for margin set instructions.
- Turn to Section 12.3 for counter reading instructions.
- See Section 12.2.1 to read and Section 12.2 to interpret the error logs.

Note: *If a soft error message occurs, (cassette missing, LCIT not loaded, etc) press [1] then [6] to go around the error. If the error cannot be gone around, set the engine drive board switches to off, and go to the Section 6.3.*

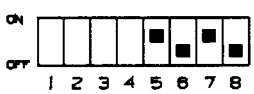
12.1 Bringing Up the Engine Board Menu

12.1.2 Setting the Parameters

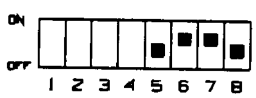
Setting parameters involves selecting paper feed source, paper path, and output tray.

You can change the parameters, without powering down the printer, by initializing the engine through ENGINE RESET selection of the engine board menu.

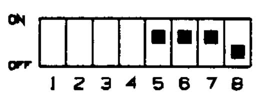
- Switches **5** and **6** select the paper input.



Setting for **upper cassette** feeding.

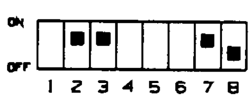


Setting for **lower cassette** feeding

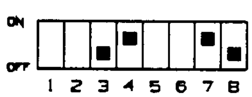


Setting for **LCIT** feeding.

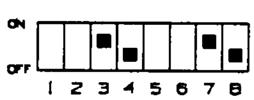
- Switches **3** and **4** select the output stack.



Setting for **upper LCOT** stacking.

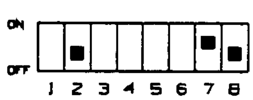


Setting for **lower LCOT** stacking

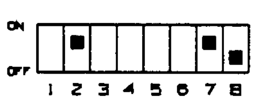


Setting for **side tray** stacking.

- Switch **2** select simplex or duplex printing.



Setting for upper **simplex** printing.



Setting for upper and lower **DUPLEX** PRINTING.

12.2 Engine Drive Board Error Messages and Error Logging

In most instances the engine drive board error displays correspond to the query bits shown in Chapter 5 and to the error codes that appear in Chapter 6. Table 12–1 shows the message category, how to decode the numeric portion of the error message:

Table 12–1 Engine Drive Board Error Messages

Error display	Comment
WARMING UP	The fusing unit has been turned on or is warming up.
FATAL ERROR NO.	See **Hardware Error** 20 through 36 and query byte 2 and 3
LCIT FATAL NO.	See **Hardware Error** 40 through 43 and query byte 4
DPX FATAL NO.	See **Hardware Error** 50 through 52 and query byte 5
COVER OPEN NO.	See diagnostic error codes 11xx.0070 through 11xx.0075 and query byte 7
DC MOTOR ERROR NO.	See diagnostic error codes 11xx.0080 through 11xx.0083 and query byte 8
INPUT TRAY ERROR NO.	See query byte 9
OUTPUT TRAY ERROR NO.	See query byte A
PROCESS UNIT NO.	See query byte D
USERMAINT REQ. NO.	See query byte E
OTHER ERROR NO.	See query byte F

(continued on next page)

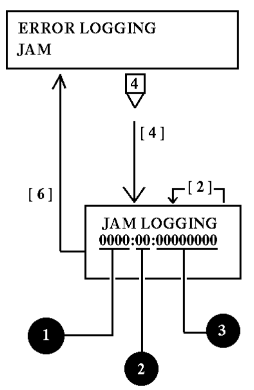
12.2 Engine Drive Board Error Messages and Error Logging

Table 12–1 (Cont.) Engine Drive Board Error Messages

Error display	Comment
PAPER JAM NO	Gives the location of the first jam. Location of first jam is: 01: Upper cassette feeding jam 02: Lower cassette feeding jam 03: LCIT feeding jam 04: Duplex feeding jam 05: Duplex transport jam 06: Cabinet jam 07: Option LCOT jam 11: Transport jam (engine) 12: Engine exit to LCOT jam 13: LCOT eject jam 14: Engine exit to cabinet jam 15: Jam in fusing unit 20: Fatal error jam 21: Cover open jam

12.2.1 Error logging

The engine drive board firmware has error logging for jams and fatal errors.

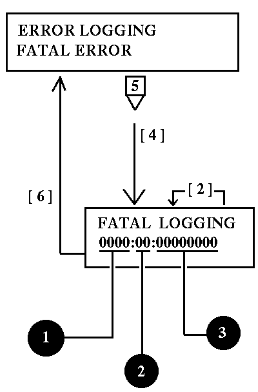


From the error logging jam menu press [4] to display the jam logging data, as shown in the accompanying figure. Press the [2] key to display previous errors. The data is formatted as follows:

❶ Total number of jams to since power on.

❷ Jam location code. See Table 12–1

❸ Maintenance counter count at time of jam.



From the ERROR LOGGING FATAL menu press the [6] key. Press the [2] key to display previous errors.

❶ Total number of fatal errors.

❷ Most recent error code, see Table 12–1

❸ Maintenance counter count at time of error

12.3 About the Counters

The PrintServer 32 has six electronic and one electromechanical counter. There is no direct correlation between the electronic and electromechanical page count numbers they might be close or very different. By opening the front door of the print engine a person can see the number displayed on the face of the electromechanical totals counter. The number increments by one for each sheet of paper through the fusing exit sensor.

The six electronic counters are categorized as total, power on, and maintenance counters. The counter data is stored in the socket mounted mother board memory (IC103). Changing IC103 will change the value or the electronic counters.

The power on counter increments by one for each six seconds of power on time.

12.3 About the Counters

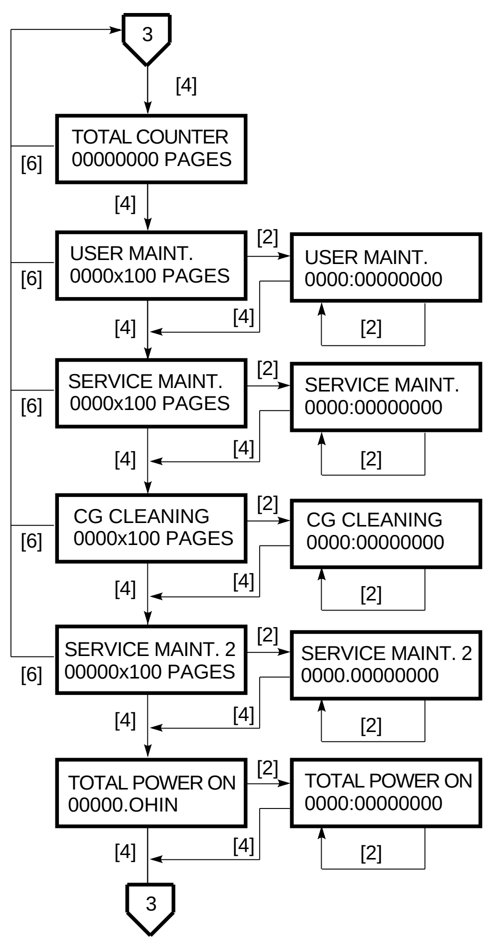
The following five counters increment by one every 2.3 seconds of main motor rotation. Each count equals one A4 (letter) size page.

- The total pages counter keeps a running count and is never reset.
- The user maintenance pages counter counts to 100, 000 and initiates a 100k user maintenance event. When the user installs a new OPC drum the drum change sensor resets this counter to zero.
- The service maintenance 1 pages counter counts to 320k and initiates a service maintenance 1 request. After performing the service, described in Chapter 11, the service engineer enters the field test mode (FTM), as shown in Chapter 4, and depresses the **2, 5, 6** keys.
- The CG cleaning pages counter counts to 500 and initiates a CG cleaning request. The counter is reset after the downline-loaded software completes a main charge wire cleaning cycle.
- The service maintenance 2 pages counter counts to 2400k and initiates a service maintenance 2 request. After performing the service, described in Chapter 11, the service engineer enters FTM, as shown in Chapter 4 and depresses the **2, 5, 1, 6** keys.

12.3.1 Reading the Electronic Counters

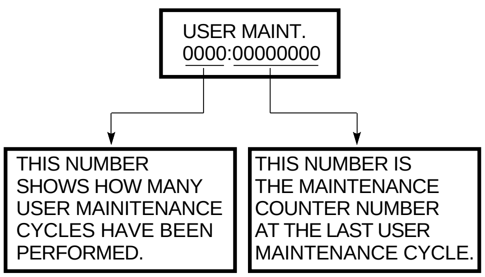
Use the following procedure to read the maintenance counters. The procedure below outlines steps required to invoke the engine drive board menu. See Section 12.1 for the full procedure.

1. To read the electronic counters first power down the printer.
2. Set switch 7 of the engine drive board switchpack to on. See Figure 12–2.
3. Power the printer on.
4. After a warm up period, if there are no errors, you will see the engine drive board menu shown in Section 12.1.1.
5. Press the [1], [2], and [2] keys to step through engine drive board menu and to arrive at the COUNTER READ menu.
6. The accompanying illustration maps the six counter read counters, shows which keys to press, and shows the sub-counters. Section 12.3.2 describes how to read the sub-counters.



12.3.2 Reading the Sub-counters

Pressing the [2] key changes the data display of a counter The following example shows the format:



12.4 Margin Adjustments

This section is about the PrintServer 32 margins adjustments. The TOP MARGIN SET, SIDE MARGIN SET, and ENGINE RESET features are used for adjusting the image position.

12.4.1 When to Adjust Margins

FRU replacement, long term wear, and customer requirements might necessitate the adjustment of the image on the sheet. Table 12–2 shows which adjustment must be checked and/or adjusted when specific FRUs are replaced.

Caution: *Cleaning unit failure and image defects will occur if you attempt to adjust the image to allow for printing to the edge of the sheet.*

Table 12–2 FRU Margin Adjustment

	Top Margins				Side Margins			
Replaced FRU	Upper	Lower	LCIT	Duplex	Upper	Lower	LCIT	Duplex
Cabinet paper feed unit	–	–	♦	♦	–	–	♦	♦
Cassette paper feed unit	♦	♦	–	–	♦	♦	–	–
Developer drawer	♦	♦	♦	♦	–	–	–	–
Duplexer/LCIT drive board	–	–	–	–	–	–	♦	♦
Duplexer unit	–	–	–	♦	–	–	–	♦

♦ = Adjust
– = No adjustment

(continued on next page)

Table 12–2 (Cont.) FRU Margin Adjustment

	Top Margins				Side Margins			
Replaced FRU	**Upper**	**Lower**	**LCIT**	**Duplex**	**Upper**	**Lower**	**LCIT**	**Duplex**
Engine drive board	♦	♦	♦	♦	♦	♦	–	–
Fork gate unit	–	–	–	–	–	–	–	♦
Fusing unit	–	–	–	–	–	–	–	♦
LCIT	–	–	♦	–	–	–	♦	–
LCIT feed unit	–	–	♦	♦	–	–	♦	♦
Optical unit	♦	♦	♦	♦	♦	♦	♦	♦
Registration clutch	♦	♦	♦	♦	–	–	–	–
Registration roller unit	♦	♦	♦	♦	–	–	–	–
Transport unit	–	–	–	–	–	–	–	♦

♦= Adjust
– = No adjustment

Table 12–3 gives the width specification for the top and side margins around the print engine test pattern.

Table 12–3 Margin Width Specifications

Margin Type	Width (mm)	Adjustment Range Full (mm)	Increments (mm)
Top	4.2 ±1.5	10.88	16(h) ±0.68
Side	4.2 ±0.5	9.6	16(h) ±0.60
Duplex offset	0.0 ±0.5	NA	NA

12.4.2 About the Margins

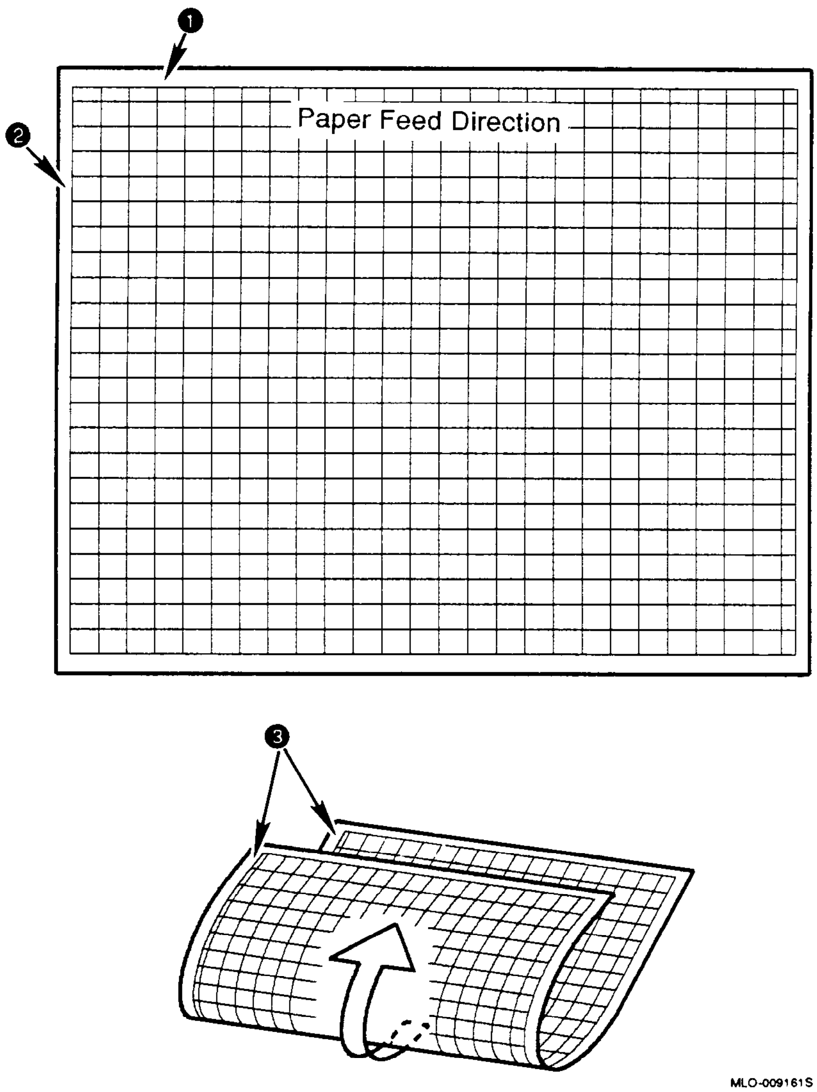
The following terms are used in the engine board menus and in this chapter.

- **Upper side** to the image printed on the simplex side.
- **Lower side** to the image printed on the duplex side.
- **Top margins** ❶ are measured from the upper or lower leading edge.
- **Side margins** ❷ are 90° from the leading edge.
- **LCIT margin** are the top and side margins when feeding from the LCIT.

12.4 Margin Adjustments

- **Duplex offset margin ❸** is the difference in position between the upper and lower margins.

Figure 12–3 Margins



12.4.3 Measuring and Adjusting the Margins

Use the following procedure to adjust margins.

1. Power down the printer and follow the instruction in Sections 12.1 and 12.1.2 to configure the engine drive board switchpack.

   Set the switches to invoke the engine drive board menu and to select the paper input, output, and path.

2. Power on the printer and allow time for the fuser to warm up.

3. Use the engine board menu to print five sample test patterns. See instructions in Section 12.1.1.

   Use a bold marker to identify the leading edge and the upper and lower sides. Use a metric ruler to measure the measure the margin width.

4. Always measure and adjust the top and side margins before the duplex offset margins. Use the following procedure:

   a. First, measure the width of the top and side margins at the a,b and c,d points, shown in Figure 12–4.

      Add the two numbers and divide by two to find the average top/side margin width. If the average width exceeds the range specified in Table 12–3, turn to Section 12.4.4) and adjust the margin.

   b. Second, measure the duplex offset margins. When precisely adjusted, the positions of the upper and lower images should coincide or line up with each other.

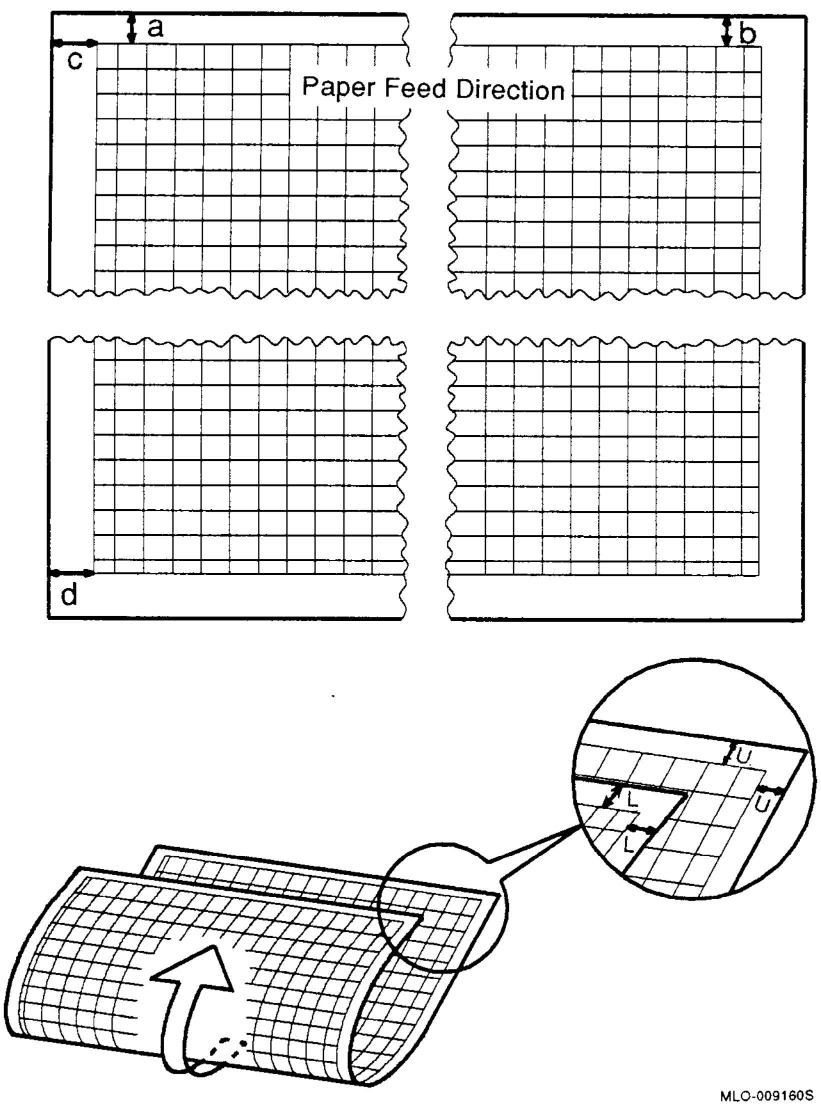
      1. Measure the top and side margins upper (u) and lower (l)sides.

      2. Subtract the measurements. The difference is the duplex offset.

      If the offset exceeds the range specified in Table 12–3, turn to Section 12.4.4) and adjust the margin.

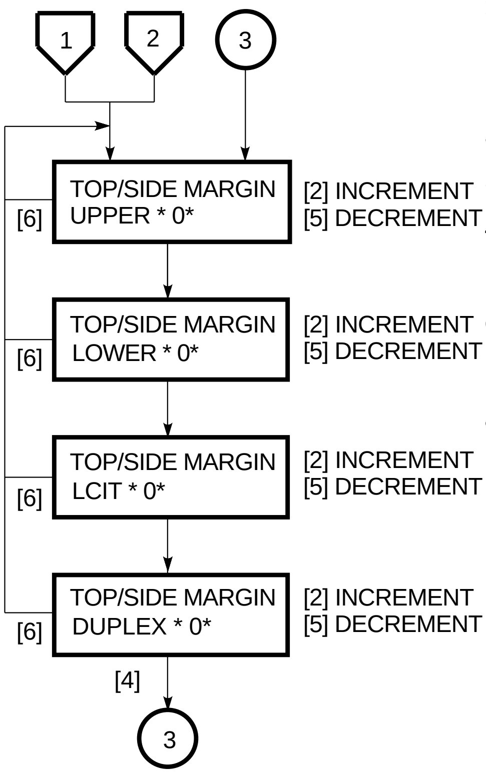
12.4 Margin Adjustments

Figure 12–4 Measuring the Margins



12.4.4 Adjusting Margins

From the engine drive board menu, select the top or side margin set and press [4] to enter the margin adjust menus.



The accompanying illustration shows the flow of the eight top and side margin menus. The following margins are adjustable:

1. Top upper
2. Side upper
3. Top lower
4. Side lower
5. Top LCIT
6. Side LCIT
7. Top duplex offset
8. Side Duplex offset

A

Recommended Spares List and FRUs

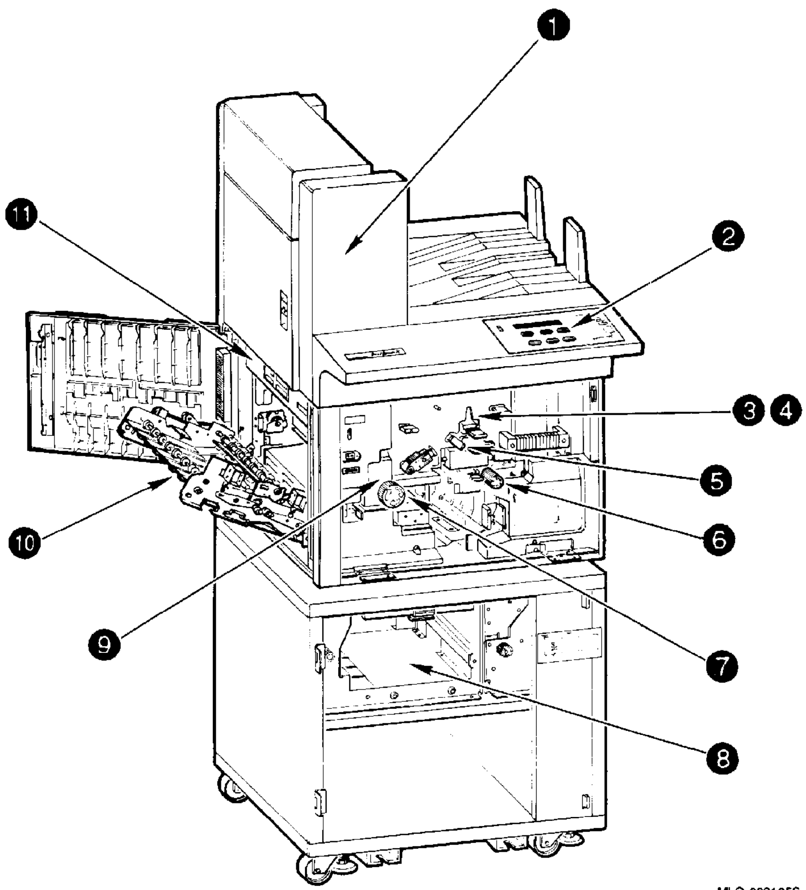
This appendix contains the PrintServer 32 recommended spare listings (RSL). Section A.1 is an illustrated listing of the field replaceable units (FRU)s and Table A–4 alphabetically displays the recommended spares listing (RSL). The terms RSL and FRU are used interchangeably and are considered synonyms.

A.1 Field Replaceable Units

Figure A–1 through Figure A–3 show the FRU locations. Table A–1 through Table A–3 list the part numbers and ordering names of the FRUs. See Appendix A for a complete list of all parts and part numbers.

A.1 Field Replaceable Units

Figure A–1 FRU Locations 1



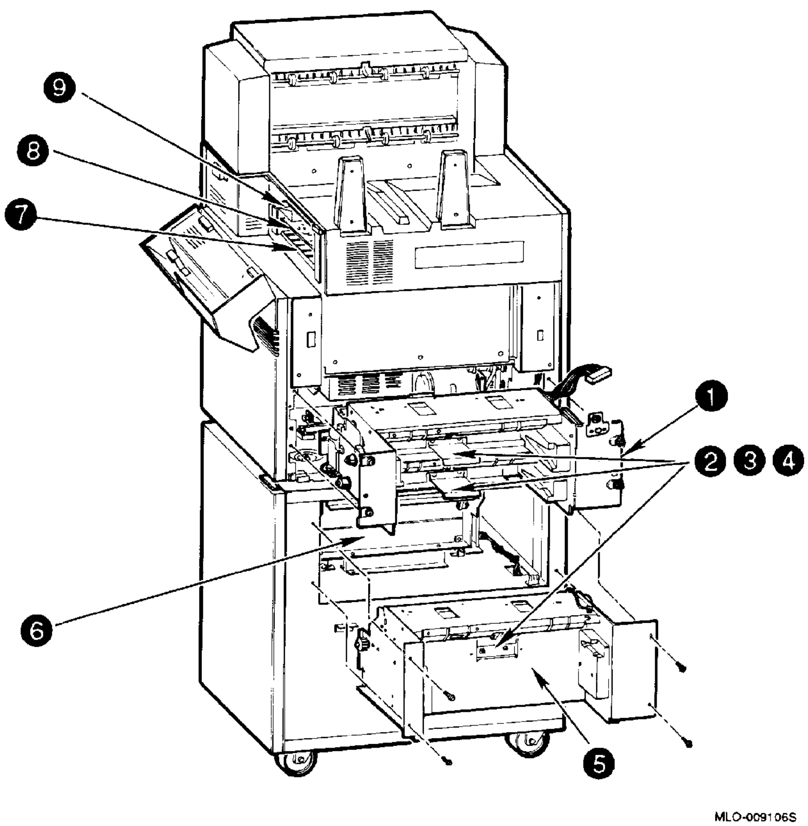
A.1 Field Replaceable Units

Table A–1 FRU Names and Part Numbers 1

Item	FRU	Part Number	Removal and Replacement Section Number
❶	LCOT	29–29644–01	Section 10.19
❷	Operator Panel	29–29641–01	Section 10.23
❸	Development Unit	29–29635–01	Section 10.8
❹	Development Drawer	29–30255–01	Section 10.6
❺	Registration Roller	29–30253–01	Section 10.27
❻	Main Fan	29–29633–01	Section 10.25
❼	Transport Unit	29–29643–01	Section 10.31
❽	Duplexer Unit	29–29646–01	Section 10.10
❾	Fusing Unit (100V) Fusing Unit (200V)	29–29637–01 29–29638–01	Section 10.14
❿	Fork Gate Unit	29–29639–01	Section 10.12
⓫	Optical Unit	29–29631–01	Section 10.28

A.1 Field Replaceable Units

Figure A–2 FRU Locations 2



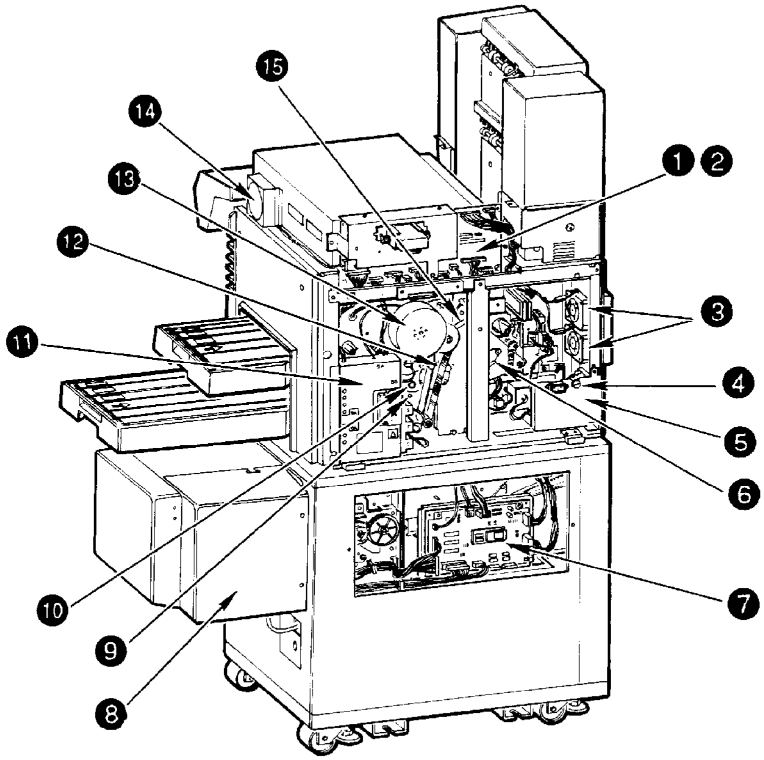
A.1 Field Replaceable Units

Table A–2 FRU Names and Part Numbers 2

Item	FRU	Part Number	Removal and Replacement Section Number
❶	Cassette Paper Feed Unit	29–29632–01	Section 10.3
❷	Prefeed Rollers (3) Feed Rollers(3) Separation Rollers (3)	29–25103–00 29–25102–00 29–25104–00	Section 11.3
❸	LCIT Feed Unit	29–29645–01	Section 10.17
❹	Cabinet Paper Feed Unit	29–27358–01	Section 10.1
❺	Memory Board (option)	???	Section 10.11
❻	PrintServer 32 Controller Board	54–20830–03	Section 10.11
❼	Engine Drive Board	29–29640–01	Section 10.11
❽	Development unit Fans	29–29657–01	Section 10.8

A.1 Field Replaceable Units

Figure A–3 FRU Locations 3



A.1 Field Replaceable Units

Table A–3 FRU Names and and Part Numbers 3

Item	FRU	Part Number	Removal and Replacement Section Number
❶	Mother Board Mother Board Fuse	29–29625–01 ???	Section 10.16 Fuse–3.5A
❷	Ozone Filter Fans (2)	29–29649–01	Section 10.24
❸	LVPSA (100V) LVPSA (200V)	29–29626–01 29–29627–01	Section 10.20
❹	Main Drive Unit	29–29628–01	Section 10.21
❺	Duplexer/LCIT Drive Board	29–29647–01	Section 10.10
❻	LCIT	30–39034–06	Section 10.17
❼	Main Motor	29–29630–01	Section 10.22
❽	High-Voltage Power Supply	29–29650–01	Section 10.15
❾	OPC Drum Timing Belt	29–27374–01	Section 10.21
❿	Development Motor Unit	29–29636–01	Section 10.7
⓫	Card Cage Fan	29–27484–01	Section 10.2
⓬	Charge Wire Cleaner Motor	29–29634–01	Section 10.5

A.2 RSL in Alphabetical RSL Listing

Table A–4 lists, in alphabetical order, the PrintServer 32 recommended spares, their associated part numbers, and ordering names.

Table A–4 Recommended Spares List

Description	Part Number
Board, Controller	54–20830–03
Board, Duplexer/LCIT	29–29647–01
Board, Engine drive	29–29640–01
Board, LCIT feed motor	29–30293–01
Board, mother	29–29625–01
Cabinet paper feed unit	29–27358–01
Cassette, large	LPS4X–BB
Cassette, small	LPS4X–BA
Charger, main wire	29–30258–01
Charger, mounting bracket T/S wire	29–30256–01
Charger, transfer/separation	29–30252–01
Circuit breaker 8A, 250Vac	29–29652–01
Circuit breaker 15A, 100Vac	29–29651–01
Cleaning unit	29–30254–01
Clutch, LCIT feed (TMO–F–03)	12–37052–02
Clutch, cassette paper feed (TMO–F–01)	12–37052–01
Development or toner knob	29–30348–01
Development unit	29–29635–01[1]
Development unit toner cover (no knob)	29–30346–01
Drawer unit	29–30255–01
Duplex unit	LPS3X–DA
Fan, card cage	29–27484–01[1]
Fan, development unit cooling	29–29657–01
Fan, main	29–29633–01

[1] LPS20 Compatible

(continued on next page)

Table A–4 (Cont.) Recommended Spares List

Description	Part Number
Fan, ozone	29–29649–01
Feed unit, cassette paper	29–29632–01
Fork gate unit	29–29639–01
Fusing unit, 100Vac	29–29637–01
Fusing unit, 200Vac	29–29638–01
Fusing, separation pawl	29–29654–01
Fusing, thermistor & fuse	29–30278–01
High–voltage power supply	29–29650–01
Interface bracket	17–03381–01
Interlock switch, fusing	29–29642–01
Interlock switch, lower side door	29–27363–01
Interlock switch, LCOT door	12–37037–01
Kit A, customer (LPS3X–AA)	22–10690–01
Kit B, customer (LPSXX–AD)	22–10692–01
Kit C, customer (LPS3X–A)	22–10691–01
Kit, drum change linkage	29–30349–01
Kit, paper feed rollers	29–30302–01
Kit, retaining rings and clips	29–25883–00
Kit 100V, Serviceman PM ???	29–29655–01
Kit 200V, Serviceman PM ???	29–29656–01
LCIT feed unit	29–29645–01
LCIT w/7 trays LPS3X–BA ???	30–39034–05
LCOT unit	29–29644–01
Main drive unit	29–29628–01
Motor unit, development	29–29636–01
Motor unit, main	29–29630–01
Motor, wire cleaning	29–29634–01
OPC (LPS20 KIT)	LPS2X–AD
Operation panel, LCIT	29–30260–01

(continued on next page)

A.2 RSL in Alphabetical RSL Listing

Table A–4 (Cont.) Recommended Spares List

Description	Part Number
Operator's panel	29–29641–01
Optical unit	29–29631–01
Ozone filter	29–30264–01
Paper feed pick up roller	29–25103–00[1]
Paper feed roller	29–25102–00[1]
Paper feed separation roller and torque limiter	29–25104–00
Paper feed separation roller skin ???	29–29653–01
Power supply unit, low–voltage, 200Vac	29–29627–01
Power supply unit, low–voltage, 100Vac	29–29626–01
Pulley:32T, OPC drive	29–27380–01
Quenching led unit	29–29648–01
Receptacle, main charger high–voltage	17–03382–20
Receptacle, t/s charger high–voltage	17–03382–21
Registration roller unit	29–30253–01
Registration unit cap screws	29–30257–01
Sensor, cassette paper feed unit	29–27397–01[1]
Sensor, cleaning unit set	29–27362–01[1]
Sensor, drum change	29–27373–01
Sensor, drum set	29–27365–01
Sensor, duplex entrance	29–30297–01
Sensor, duplex transport closed	29–30289–01
Sensor, duplex reverse	29–30287–01
Sensor, fusing exit	29–30275–01
Sensor, registration	12–37049–01[1]
Sensor, side stack-overflow	29–27397–01[1]
Sensor, side tray closed	29–27397–01[1]
Sensor, toner empty sensor	29–27373–01
Sensor, upper and lower LCOT offset	29–27397–01[1]

[1] LPS20 Compatible

(continued on next page)

Table A–4 (Cont.) Recommended Spares List

Description	Part Number
Sensor, upper and lower LCOT exit	29–30287–01
Shield glass	29–30259–01
Solenoid fork gates (both)	29–30274–01
Solenoid, LCIT feed	29–30301–01
Solenoid, LCOT fork gate	29–30284–01
Solenoid, cleaning roller	29–29658–01
Solenoid, separation pawl	29–27400–01
Spring loaded stacking tray	29–30267–01
Spring, drum change sensor linkage	29–30270–01
Springs, lower stacking tray	29–30268–01
Springs, upper stacking tray	29–30282–01
Switch, toner overflow	29–27369–01[1]
Timing Belt, 256MXL, fork gate	29–30273–01
Timing Belt: 116XL, cassette unit	12–37042–01
Timing Belt:140MXL, duplex entrance	29–30291–01
Timing Belt:225MXL duplex exit	12–37045–01
Timing Belt:271MXL, LCOT	29–30283–01
Timing belt:166XL, OPC drum	29–27374–01
Timing belt:194XL	29–30286–01
Total Counter	29–29629–01
Transport unit	29–29643–01
Tray, LCOT upper exit	29–27392–01
Zener diode, main charger	29–30266–01

[1]LPS20 Compatible

B

Total Call Concept Procedures

B.1 Theory Behind Total Call Concept

The total call concept (TCC) evolved to meet the service requirements of Digital's electrophotographic printer systems. TCC improves the printer's reliability, increases the time between service calls, and improves customer satisfaction.

TCC differs from traditional Customer Services operating philosophy. Traditionally, when a printer malfunctioned, Customer Services fixed the problem and left the site as quickly as possible to minimize the mean time to repair (MTTR).

However, electromechanical printers require preventive maintenance. With TCC, Customer Services fixes the problem and performs TCC procedures.

B.2 Preliminary TCC Procedure

FCO and firmware inspection

Before going to the site, look up and list the current hardware field change order and firmware revision levels. You will need them later.

Printing the maintenance log form

A maintenance log sheet file is stored in the LPS$SUPPORT directory of the supporting host. Use the following procedure to print the log:

1. Ask the system manager for assistance. The system manager can best answer system-dependent questions and give you the Field account password. The system manager may also print out the maintenance log file for you.
2. Log in to the Field account.

   Caution: *Be careful when working in the Field account. It may have unlimited privileges.*
3. Set default to the LPS$SUPPORT directory of the supporting host.

B.2 Preliminary TCC Procedure

Generally, the supporting host is configured with client software, and you can log in and print the file. If the supporting host does not have client software, you must log in to a client node, copy the file to your client system, then print the file.

4. Copy the maintenance log file to a client node:

```
$ COPY NODE::LPS$SUPPORT:LPS_32MAINT_LOG.PS  []*
```

Where:

NODE is the node name of the supporting host. Get the supporting host node name from the system manager. Type two colons (::) after the node name.

5. Print a A3 size maintenance log sheet:

```
$ PRINT/QUE=PSQ/PARAMETER=(DATA=POST,PAGE_SIZE=A3)-
 _$ LPS$SUPPORT:LPS_32MAINT_LOG.PS
```

Where:

PSQ is the PrintServer queue name.

B.3 Inspecting the Hardware

Use the checklists in Sections B.3.1, B.3.2, and B.3.3 to inspect the print engine, LCOT, and LCIT. Look for signs of wear and tear, damage, and potentially malfunctioning components. Repair or replace any faulty component(s).

B.3.1 Print engine

Use the checklist below to inspect the print engine. Repair or replace any faulty component(s).

- Look for toner spills inside and outside the print engine.
  - Find the source of the spill. Pay specific attention to the area under and around the cleaning unit and the end seals of the development unit.
  - Clean up any toner, dust, or paper fragments.
- Remove and clean the main charger and the transfer/separation chargers.

  Inspect the condition of the spring contacts. Look for bent metal, corrosion, or other signs of damage. Replace any damaged components.
- Remove and clean the registration roller unit.

  When you inspect rollers, look for axial shaft bearing problems and for surface or shape distortions. The shafts and the rollers on the shafts must run true and you should not feel excessive axial or radial free play or binding. Roller defects to look for are out of round rollers, surface cracks or glazing, or excessively hard rollers.
- Remove and clean the quench lamp.
- Remove the OPC drum.
  - Inspect the drum surface for nicks, scratches, or marks.
  - Install the print drum and close and power up the system.
  - Print a test sheet and inspect the print quality.
- Inspect the transport unit belt and vacuum fan.

  When you inspect the belts, look for wear, fraying, and tension. The PrintServer 32 uses high-quality cog-type belts. The belts serve a dual purpose; they transmit motor power and maintain close mechanical timing required for precision jam detection. A loose, slipping, or worn belt can cause random jams. If you suspect a belt, hold the old belt up to a new belt to compare cog depth, size, or other physical dimensions.

Replace any belt that is frayed, has missing or worn teeth, or is over 5 years old.

- Remove the fusing unit.
  - Inspect the heat and pressure rollers for wear, scratches, flat spots, and other surface damage.
  - Replace any bent, worn, or damaged fusing unit stripper fingers.
- Inspect all timing belts for wear, fraying, and correct tension.
- Manually operate the solenoids to see if they bind or hang.
- Look for frayed wire(s) that can become entangled in the moving parts.
- Inspect the card cage fan, main fan, and ozone fan for correct and noise-free operation.
- Listen to the main, development, and polygon motors. The motors should run quietly and not emit any loud or unusual noises.
- Install and clean all covers and panels.
- All hinged covers and interlocks must work smoothly and latch securely.

B.3.2 LCOT

After performing the print engine inspection, closely inspect the LCOT.

- The LCOT must be free of dust and dirt, which can mark the printed sheets.
- All hinged devices and interlocks must work smoothly and latch securely.
- Power up the printer and wait for the initialization sequence to jog the LCOT offset motors back and forth. Make certain both motors complete the full movement.

B.3.3 LCIT and Cassette

Use the following checklist to inspect the LCIT and cassettes. Repair or replace any faulty component(s).

- Inspect each cassette tray for damage and correct configuration. Advise the customer to replace any cracked or broken trays.
- Inspect the cassette and LCIT paper feed rollers. Replace any dirty, deformed, or damaged rollers.
- All hinged covers and interlocks must work smoothly and latch securely.
- Clean the trays and the LCIT of dust and paper debris.

B.4 Final Inspection Inspection the FCO and firmware

FCO and firmware

Use the following checklist to determine if you need to arrange to update the printer. If you find that revisions are needed, make an appointment to obtain and install the updated hardware and firmware devices.

- Are all current hardware FCOs installed?
- The Operator panel displays the firmware revision level of the following installed boards:
  - Controller board
  - Engine drive board
  - Duplexer/LCIT drive board

Replace any board that has outdated firmware.

Update the maintenance log.

Fill out the maintenance log, store it in a binder, and place the binder on the bottom shelf of the printer cabinet.

C

Documentation, Tools, and Training

This appendix provides information about the following PrintServer 32 service requirements.

- Section C.1, Tools
- Section C.2, Documentation Ordering Information
- Section C.3, Training

C.1 Tools

Table C–1 lists the ordering number of the tools that are needed to service the PrintServer 32 in the field.

NOTE: *(Caution) Do not use a home-type vacuum cleaner to clean toner spills. Without the special filter, toner powder goes through the vacuum and into the air. Other equipment in the vicinity can ingest the airborne toner and be damaged.*

Table C–1 Tools

Number	Description
29–26106–00	50-Hz terminal tool kit
29–26109–00	60-Hz terminal tool kit
29–11762–00	Antistatic kit
29–26259–00	Vacuum[1] and attachments, 200 volts
29–25526–00	Vacuum[1] and attachments, 120 volts
29–26017–00	Filter bags and filter shell

[1]Special vacuum cleaner for toner powder

(continued on next page)

C.1 Tools

Table C–1 (Cont.) Tools

Number	Description
29–26234–00	Cleaning kit
29–27340–01	Terminal tool kit

C.2 Documentation Ordering Information

Table C–2 Documentation

Number	Description
EK–FIELD–DK	The PrintServer 32 Service Guide Documentation Kit includes the following: • *PrintServer 32 Printer Service Guide* EK–LPS32–SG–001 • LCIT and Duplexer board schematics EK–LCITS–SC–001 • PrintServer 32 controller board schematic EK–CONTS–SC-001
EK–LPS32–DK	The PrintServer 32 documentation kit consists of the following: • *PrintServer 32 Installation Guide* EK–LPS32–IG–001 • *PrintServer 32 Operator's Guide* EK–LPS32–OG–001 • *PrintServer 32 User's Guide* EK–LPS32–UG–001 • *PrintServer 32 spine set* EK–LPS32–SS–001 • *User Features Reference Card* EK–TPS20–001 • *Digital Laser Printers Guide to Paper and Other Media* EK–LASER–GD–001
EK–LPS32–IP	*PrintServer 32 Illustrated Parts Breakdown*
AA–PBWHA–TE	*Digital ANSI-Compliant Printing Protocol Level 3 Programming Supplement*
AA–PBWFA–TE	*PostScript Translators Reference Manual for ReGIS and Tektronix 4010/4014*

C.3 Training

Before attempting to use this book and repair the printer, you must attend the specific Digital Education training course and all other prerequisite training courses.

The following table gives the ordering numbers and information about the courses.

Table C–3 Training

Number	Description
EY–F4873–PO	DEClaser SPI/lab training course is offered at FTC A and B sites worldwide.
	United States Training Prerequisite Courses
EY–7629E–IV	Hardcopy and video specialist core course
EY–5528E–IV	Laser safety and printer concepts course
	Europe and GIA Training Prerequisite Courses
EY–2830E–IV	Data Communication Fundamentals
EY–2239E–IV	Hardcopy Theory
EY–2423E–IV	Laser Printer Concepts
EY–2424E–IV	Laser Concepts and Safety
RECONCILE	
	• Laser Concepts and Safety (EY–2423E–IV) • Laser Printer Concepts (EY–2424E–IV)
(EY–?????–LO)	PrintServer 32 Operation and Servicing

Glossary of Parts

G.1 Clutches

Cassette paper feed clutches

Two clutches, part of the cassette paper feed unit. When the selected upper or lower clutch energizes, torque is applied to the feed roller shaft. The feed roller turns and feeds a sheet of paper into the registration rollers.

LCIT paper feed

Within the LCIT paper feed unit. It energizes to turn the LCIT feed roller shaft. The feed roller turns to feed a sheet of paper into the LCIT paper feed unit.

Registration clutch

Part of the main drive unit. The clutch energizes to turn the registration roller thus moving a sheet over the transfer charger. The timing of the registration clutch varies to adjust the position of the image between the leading and trailing edges of the sheet. See Chapter 12 about the adjustments.

G.2 Fans

Card cage (controller) fan

Panel mounted on the top cardcage. Blows cool air into the card cage.

Development unit fans

Two fans, panel mounted over cassette paper feed unit. Blow external air over the development unit to stabilize its temperature.

Main fan

Extracts ionized air from around the print drum. The fan is replaced as part of the maintenance 2 service procedures, described in Chapter 11.

Ozone filter fans

Remove engine air blowing it through the ozone filter.

PSU fan

Panel mounted on the power supply unit. It blows cool air into the low voltage power supply.

Transport fan

Part of the transport unit. A vacuum from the fan holds the printed, unfused sheet firmly to the moving transport belt.

G.3 Motors

Charge wire cleaning motor

Engages, via the shaft gear, the wire cleaning device on the main charge unit.

Development motor

Drives the developer and paper feed rollers.

Duplex feed motor

Part of the duplex unit. It moves paper from the duplex unit to the rollers of the cabinet feed unit.

Duplex motor

Within the duplex unit. It moves the sheet of paper out of the vertical and into the horizontal exit rollers thus turning the paper over and swapping trailing for leading edges. It also feeds the paper up into the cabinet feed unit for second side printing.

LCIT feed motor

Within the LCIT feed unit. It drives the LCIT feed and cabinet feed units.

LCIT lift motor

Within the LCIT unit. It drives the LCIT elevator up and down.

LCOT eject motor

Part of the LCOT. It drives the LCOT exit rollers, and upper and lower fork gate rollers.

Main motor

Drives the print drum, transport, and fusing unit.

Scanner motor

Within the optical unit. It spins a polygonal mirror causing the laser beam to scan across the surface of the print drum.

Upper and lower cassette motors

Lifts the lower plate of the cassette to the feed rollers, When a cassette is inserted.

Upper and lower separation motors

Within the LCOT unit. The motors turn cams that move, or offset, the output rollers from side to side.

G.4 Sensors

Cabinet feed sensor

An reflecting sensor, part of the cabinet paper feed unit. This sensor detects paper after feeding from the duplex or LCIT units.

Cleaning unit set sensor

An interrupter sensor, bracket mounted on the rear bulkhead of the print engine. A flag on the cleaning unit actuates the sensor, when the development draw is fully closes and the cleaning unit is moved into position on the print drum.

Drum change sensor

An interrupter sensor, mounted on the rear bulkhead of the print engine. When the control board firmware displays the "Replace OPC drum" message, the customer must install a new print drum. On The first revolution, the two plastic activators on the drum end lift the sensor linkage, actuate the sensor, and than the linkage shears (breaks) both activators off the drum. The sensor signals the control board which clears the display.

Drum set sensor

A reflectance sensor, bracket mounted on the rear bulkhead of the print engine. Detects if the print drum is properly set.

Duplex entrance sensor

An interrupter type sensor, mounted in the duplex unit. It detects paper entering vertical portion of the duplex paper path. When it detects the trailing edge, it closes the fork gate and reverses the duplex and duplex feed motors. The sheet moves into the exit (horizontal) section of the duplex unit.

Duplex reverse sensor

A reflectance sensor, part of the duplex unit. The sensor detects paper in the vertical (entrance) paper path of the duplex unit.

Duplex exit sensor

An interrupter sensor, part of the duplex unit. Positioned at the exit end of the duplex unit, it signals the control board that paper is in the duplex feed rollers.

Duplex transport closed sensor

An interrupter sensor, part of the duplex unit. A tang on the closed duplex transport actuates the sensor.

Front cover closed sensor

An interrupter sensor, mounted on the print engine. When the front door is fully closed, a metal tang actuates the sensor. The molded ridges on the front door keep the door from closing unless the development draw is closed and transfer charges is raised.

Fusing exit sensor

An interrupter sensor, part of the engine fork gate unit. It detects leading edge after the sheet emerges from fork gate entrance rollers. Because the fusing exit and registration sensors detect most print engine jams, there operation and position is fully discussed in Chapter 8.

LCIT empty sensor

A interrupter type sensor, part of the LCIT feeder unit. When the LCIT is empty, the sensor linkage falls into a notch on the elevator bed and into the sensor.

LCIT height Sensor

A interrupter type sensor, part of the LCIT feeder unit. The rising paper stack lifts the prefeed roller that is the sensor linkage. When the sensor is actuated, the duplexer/LCIT control board turns off the elevator lift motor.

LCIT Upper or Miss Set Sensor

An interrupter type sensor, part of the LCIT unit. It prevents damaging elevator motion if the paper is incorrectly installed. The sensor linkage is a bar that crosses the top of the paper stack. If the incorrectly installed paper misses the height sensor linkage (prefeed roller), it will lift the linkage and actuate the upper limit sensor. The duplex/LCIT control board then shuts off the LCIT elevator motor thus preventing damage elevator motor.

LCIT lower limit sensor

An interrupter type sensor, part of the LCIT unit. It senses the lower limit of elevator travel. When actuated, the duplexer/LCIT control board turns off the elevator motor.

LCIT size sensor

A 5-bit interrupter type sensor, part of the LCIT unit. It senses the position of the LCIT paper size dial.

Registration sensor

A reflectance type sensor, part of the cassette paper feed unit. It detects paper fed from the cassettes or from the cabinet feed unit. Positioned in front of the registration rollers, it detects the sheet's leading edge slightly before it reaches the registration rollers.

Side exit overflow sensor

An interrupter sensor, part of the fork gate unit. As the height of the side tray stack rises, it lifts the sensor linkage and actuates the sensor.

Side tray closed

An interrupter sensor, mounted on the fork gate unit. When the side tray is closed, a tang actuates the sensor, signaling the control board.

Temperature fuse

A thermal sensing fuse, part of the fusing unit. If the heat roller temperature raises drastically above normal, the fuse link will melt, open, and stay open. This disconnects the fusing current from the heater permanently disabling the printer.

Thermistor

An analog output thermocouple, part of the fusing unit. The sensor generates a voltage signal proportional to the temperature of the heat roller. The engine control board monitors temperature, turning the fusing current on and off to control the temperature.

Toner empty sensor

An interrupter sensor, sensor mounted on the rear bulkhead of the print engine, behind the development draw. When toner is exhausted, a cam on the development unit trips the linkage that actuates the sensor. ???

Toner cartridge set sensor

An interrupter sensor, mounted on the inside rear bulkhead of the print engine. When the development draw is fully closes, the molded flag on the rear of the development unit actuates the sensor.

Upper and lower cassette size sensors

An assembly of seven interrupter type sensors, part of the cassette paper feed unit. It detects and measures the paper size tab on the installed cassette. The engine drive board decode the seven bit code to determine if a cassette is removed or installed; and what size paper the cassette is configured for.

Upper and lower empty sensors

An interrupter sensor, part of the cassette paper feed unit. When a cassette is empty, the sensor linkage falls into a notch on the cassette elevator and actuates the sensor.

Upper and lower exit overflow and reset sensors

Two pairs of interrupter sensors, part of the LCOT unit. The rising height of the output stack lifts the linkage which sequentially actuate the pair of sensors. Both sensors must actuate before an "Output tray full" message is displayed and transmitted back to the host. This arrangement does away with bothersome intermittent or multiple error messages caused by a changing stack level due to paper settling.

Upper and lower height sensors

An interrupter sensor, part of the cassette paper feed unit. The cassette motor lifts the stack into the prefeed roller. The roller, which is also the sensor linkage, lifts and actuates the sensor.

Upper and lower home position sensors

An interrupter sensor, part of the LCOT unit. The sensors detect when the upper or lower offset rollers are in the home (left/right) position.

Upper and lower LCOT exit sensors

Two reflectance sensors, part of the LCOT unit. The upper sensor looks for jams and detects paper approaching the upper facedown stack. The lower sensor detect paper approaching the LCOT fork gate. Its signal causes the LCOT controller to open the fork gate if the lower facedown stack is selected.

Upper and lower offset sensors

An interrupter sensor, part of the LCOT unit. Detect when the upper or lower offset rollers are in the offset (left/right) position.

G.5 Solenoids

Cleaning roller solenoid

Mounted on the shelf over the fusing unit. When energized, the armature moves down through the top of the fusing unit to press the cleaning roller lever, moving the cleaning roller into the heat roller.

Duplex fork gate solenoid

Part of the duplex unit. Paper coming down from the engine is directed to the auxiliary exit or the vertical entrance guide of the duplex unit. When the sheet reverses in the entrance paper path, the duplex fork gate closes, directing the sheet into the duplex feed rollers.

LCIT feed solenoid

Part of the LCIT unit. When it energizes, the LCIT prefeed roller drops onto the stack of paper.

LCOT fork gate

Part of the LCOT. It operates the LCOT fork gate. When the solenoid energizes, the fork gate directs the sheet into the lower tray exit rollers.

Separation pawl solenoid

Mounted on the rear bulkhead of the print engine. It connects to the print drum separation pawl through linkage mounted on the development drawer. When it energizes, the linkage moves the pawls into contact with the print drum and shifts the position of the pawls parallel to the drum.

Upper and lower fork gate solenoids

Part of the engine fork gate unit. The gates set up to direct paper into the LCOT, side tray, or down to the duplex fork gate.

G.6 Switches

Front cover interlock switch

Consists of a jumper that is mounted on the front cover. When the cover is open, it disconnects the current that operates the laser diode and the main and development motors.

Fusing interlock switch

Mounted on a bracket at the rear of the engine; actuated by the front cover. When the cover is closed, a tang depresses a linkage which depresses the interlock switch. When the switch is depressed, the high-current fusing circuit is complete and operable.

LCIT cover interlock switch

Actuated by a linkage that must be pressed by tangs on both LCIT doors. When a LCIT door is open, it disconnects the current to the LCIT lift motor.

LCIT dial positioning switch

Part of the LCIT unit. It turns on when the dial is set to a paper size and off when the dial is set between sizes.

LCOT cover interlock switch

Actuated by a tang on the LCOT door. When the door is open, the LCOT lift and main motors will not run.

Left cover interlock switch

Mounted on the engine; actuated by a tang on the left door. When the door is open, the switch opens the 24Vdc main motor current.

Power (1/0) switch

Accessible to customers and operators. It turns the printer on and off.

Toner overflow switch

Mounted over the cleaning unit. When toner fills up the unit, it lifts a fixed magnet out of the cleaning unit into the Hall-type toner overflow switch.

G.7 Miscellaneous

Noise filter

A passive reactive filter device, part of the low-voltage power supply unit. It prevents electrical noise generated within the printer from entering the power line.

Totals counter

Mounted on the print engine. Counts the number of printed sheets. One count for each side

Zener diode

Mounted in a well in the rear of the cleaning unit. The diode controlls the charge on the grid of the main charging unit and assuere an even charge.

Set sense jumper lines

Located in the lcot, fusing unit and lcit. When the unit connector is installed, they jumper togather two or more pins.

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